MARCH, 1944

Industrial FINISHING

Published Monthly in the Interest of Modern Production Finishing

TO "Finish"

Hitler and Hirohito quickly is our best INSURANCE for the future . . . .

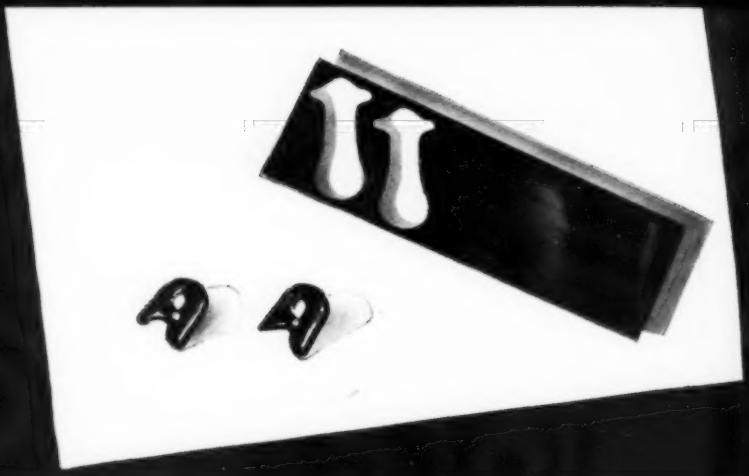
PUBLIC LIBRARY
MAR 24 1944
DETROIT

Finish your products with LILLY'S DEPENDABLE FINISHES... your best INSURANCE against Finishing troubles.

Lilly FINISHES

LILLY VARNISH COMPANY

THE LILLY COMPANY, High Point, North Carolina



These *new-born* fasteners wear coats that are 18 *years old!*

HERE ARE THE FACTS! Just recently we offered a $100 War Bond to the customer who had the oldest sample strip of metal finished with Blue Knight Flexible Enamel. And here it is—18 years old! During these years it's been twisted and crumpled but the Blue Knight Enamel refused to flake or crack.

Then came the toughest stunt of all. We sent this same panel to The Oakville Division of Scovill Mfg. Co., and out of it they stamped these brand new fasteners—with enamel still perfect. This is dramatic proof of the inherent and permanent film strength of Blue Knight *air dry* one coat enamels.

And this is but one of *many* plastic base finishes tailored to your specific needs by Roxalin Flexible Finishes.

THE WINNER

Mr. Ralph Straub of The Kueffel & Esser Co., Hoboken, New Jersey. His 18 year old strip won the $100 War Bond.

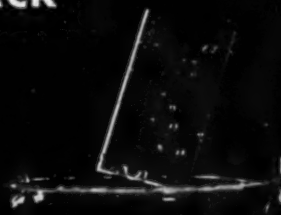
BLUE KNIGHT FLEXIBLE ENAMEL

Twist it—hammer it—there's no flaking, no cracking!

ROXALIN *Flexible* FINISHES
INCORPORATED
ELIZABETH • NEW JERSEY

Strip Enamels

FROM ANODIZED ALUMINUM WITHOUT ATTACK



Enthone Enamel Strippers have no action on anodized aluminum, aluminum alloys, zinc or magnesium.

Their use means fast stripping of enamels without attacking the base metal.

Enthone Enamel Strippers are emulsion type materials used mixed with water and in the temperature range from 160 to 168 F. Urea-formaldehyde, melamine, glyptal, phenolic and other synthetic enamels are removed quickly and cleanly.

Special Strippers for Special Problems.

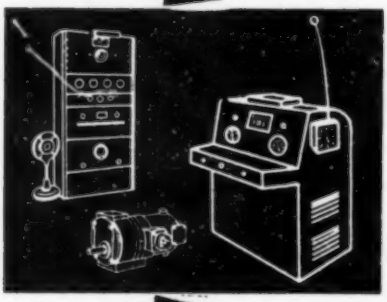
Tell Us Your Problem

ENTHONE

THE **ENTHONE** CO.

442 ELM STREET NEW HAVEN 2, CONNECTICUT

HILO RIP-PLS



Good Start for a Perfect Finish

Where beauty and toughness of finish count most, Hilo Rip-pls are most satisfactory. Every day, in service under rigorous conditions, these finishes are demonstrating their mettle . . . on sound equipment, field radios, radar, airplane panel board and control instruments, small motors, aerial cameras, etc. Hilo Rip-pls are suitable for all kinds of non-porous surfaces where a wear-resisting Protective Coating is desired.

NOW AVAILABLE WITHOUT PRIORITY
Rip-pl A—Medium Design in Gloss

AA1 PRIORITY NEEDED ON
Rip-pl D—Fine Pattern in Dull

These Hilo Rip-pls are ready for application by spraying. They bake in the customary temperature and time schedules.

Write Today for Leaflets and Samples

HILO

HILO VARNISH CORPORATION
42-60 STEWART AVENUE BROOKLYN 6, N. Y.

2420 Washburne Ave., Chicago 8, Ill. Park Square Bldg., Boston 16, Mass.

TWENTIETH YEAR OF PUBLICATION

Industrial FINISHING

W. H. ROHR, Editor E. A. DOSCH, Assoc. Editor

Vol. XX, No. 5 MARCH, 1944 $2.00 a Year

Contents of This Issue

Letters from Readers 5
Conveyorized Dipping and Infra-Red Drying 14
Lockheed Requirements for Protective Coatings 20
Survey of Methods for Cleaning Metals 41
Some Timely Pointers on Metal Finishing 50
Postwar Indications 60
Force Drying System Doubles Production 64
Design for Finishing 68
Materials, Supplies, Equipment 82
Questions and Answers 90
Booklets; Catalogs; Circulars 96
Editorial 98
Random Comment on the Industrial Scene 100
"Classified Advertising" Section 110
Index to Advertisers 111

Aircraft Parts of Wood, Paper, Plastic 16
Becomes Asst. Tech. Director at Watson-Standard 16
Mixing Equipment Awarded Army-Navy E. 59
Geo. K. Graves of Detroit Joins Jones-Dabney Co. 59
Ferbert-Schorndorfer Adds Three Salesmen 59
Will Direct P. P. G. Sales of Transportation Finishes 62
Wire Brushes for Metal Cleaning 80
Paisley Adhesives Exhibited at Chicago Packaging Show 80
"Resimene" Monsanto Products 94
Correction in Duralac Ad: "Curing", not "Curling" 94
Oberender of Zapon Retires 109
D. R. Means Promoted in Pittsburgh Plate Glass 108

Owned and Published by

Practical Publications, Inc., 1142 N. Meridian Street, Indianapolis 4, Ind.

Eastern Representative: C. A. Larson, 254 West 31st St., New York 1, N. Y.; Phone Penna. 6-9049

★

Wherever you find
Uncle Sam's Air Corps, Signal Corps or Ordnance Depots
you'll probably find

DOLAN'S *"Unquestionable Quality"* FINISHES

We have supplied many thousands of gallons of

★ O. D. LUSTRELESS
★ O. D. SEMI GLOSS
★ REFINISHING PRIMERS
★ ROT INHIBITERS
★ ZINC CHROMATE PRIMERS
★ AIRPLANE DOPES
★ "843" WATER STAINS
★ MARINE FINISHES, ETC.

We invite your inquiries on any Specification Finishes.

V. J. DOLAN & COMPANY, INC.
Manufacturers of "UNQUESTIONABLE QUALITY" *Industrial Finishes*
1830 N. LARAMIE AVE., CHICAGO, ILLINOIS

★

Decorative Coating . . .

that attracts real attention is obtained by using the best quality of

Cotton, Wool or Rayon Flocks

The best made are by CLAREMONT. That's all you need to know.

For samples, prices and general information come to

CLAREMONT WASTE MFG. CO.
CLAREMONT, N. H.

The country's largest manufacturers of Flocks

Furniture Designers

Tracing Paper

Detail Paper

For permanent record of your designs

SCHNELL & BROCK
Drawing Materials
NEW YORK N.Y.

Letters from Readers

Tumbling Polish Wax

Will you please tell us the names of any of your advertisers or subscribers who furnish material such as paraffine or polishing wax or other materials suitable for polishing and coloring dowels in a tumbler?

We would also like the name of a manufacturer who makes tumblers who could help us out with our problem.—F. Mfg. Co.

Coloring Razor Blades

We are interested in receiving information about the coloring of razor blades in some way other than with paint. Also, we are interested in suitable coating materials for razor blades. This is quite an urgent item with us and any information you can give us as quickly as possible will be appreciated.—A. P. Corp.

Iridite Found; Not "Iradite"

Referring to "Iradite," for which we were searching last month (Feb. issue, page 8), we learn that the name is "Iridite," and it is a product of Rheem Research Products, Inc., 2523 Pennsylvania Ave., Baltimore 17, Md. Quoting from the company's literature:

"The Iridite process protects zinc or cadmium surfaces from corrosion by creating a coating, integral with the metal, which cannot chip or flake off. This coating, caused by a chemical reaction with the plated metal itself, is uniform, opaque and olive drab in color, matching the familiar shade used by the armed forces for camouflage.

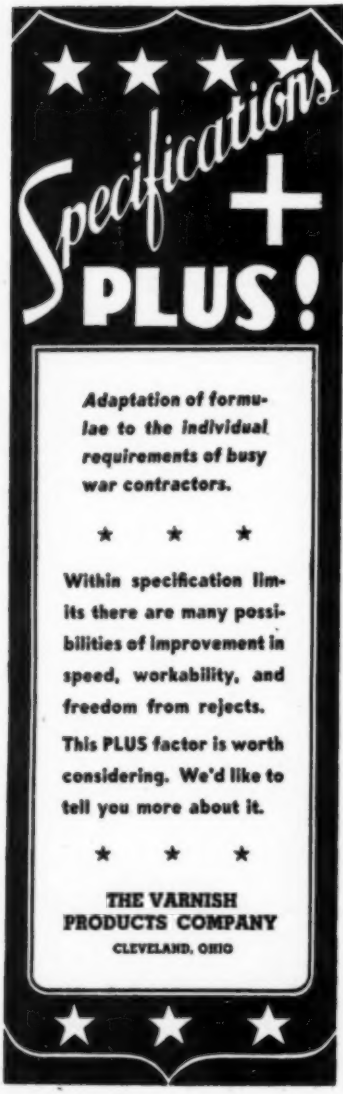
"The protective coating formed by Iridite is identical over the entire surface and can never "pile up" or

Draftsmen and Engineers

Waterproof

Finest drawing ink

SCHNELL & BROCK
Drawing Materials
NEW YORK N.Y.


Specifications
+
PLUS!
Adaptation of formulae to the individual requirements of busy war contractors.
★ ★ ★
Within specification limits there are many possibilities of improvement in speed, workability, and freedom from rejects.
This PLUS factor is worth considering. We'd like to tell you more about it.
★ ★ ★
THE VARNISH PRODUCTS COMPANY
CLEVELAND, OHIO

form adhesions between adjacent moving surfaces, such as the parts of a hinge. Complete assemblies of any type or size after treatment by the Iridite process, operate as smoothly as before.

"In addition, after it has been applied, the flexibility of Iridite permits parts to be bent, twisted or formed without chipping, flaking or affecting the protective qualities of the Iridite coating."

Transparent Coating for Plastic

Am wonding if you could refer me to someone who makes a coating for transparent plastic? Am referring to celestrial observation domes for aircraft. This material must be transparent, have good adhesion and flow out to lie flat so optical illusions are not added to the dome. Have been using a clear lacquer but have not had too good results with it flowing out so there is no distortion optically. —R. G.

Silk-Screen Work

We want to go into silk-screen methods of reproduction. Can you give us the names of people we could write to who would help us get started, please?—G. W. Co.

Infra-Red Drying

Will you please send me the names of a few of your advertisers who supply infra-red drying equipment?—(STATE UNIVERSITY).

Ceramic Finish Wanted

We note in your September, 1943, issue of INDUSTRIAL FINISHING, "Letters from Readers," a letter entitled "Can Supply Ceramic Finish," signed F. J. K. Will you please let us have the name and address of the company supplying the above ceramic finish material, as we desire sample panels in red, white, blue and yellow? —U. S. MFG. Co.

To Rollercoat Strip Steel

We are interested in a list of manufacturers equipped to supply us with machines to rollercoat synthetic enamel on both faces and edges of suitably bonderized cold-rolled strip steel, in continuous form. The strip steel measures .008-in. in thickness by 2-in. wide and comes in 125-lb. coils, one

Repeat Performance by

WRINK-ALL

MANUFACTURERS everywhere have been asking for repeat performances by WRINK-ALL, a new wrinkle made from non-critical oils.

United's technical staff worked many months to develop and perfect WRINK-ALL until it surpassed average high standards of performance.

WRINK-ALL has all the characteristics of old type wrinkle in appearance, uniformity, application, baking schedules, etc.

It is available in all colors and shades.

[*Order 5 gallons of WRINK-ALL today and give it a severe production test.*]

LACQUERS—THINNERS
METALLIZED FINISHES
SYNTHETICS AND
SPECIAL COATINGS
FOR ALL SURFACES

United Lacquer Mfg. Corp.

General Offices, Laboratory, Factory: LINDEN, N. J.

NEW ENGLAND MFG. DIVISION, BOSTON, MASS.

BACK THE ATTACK! BUY WAR BONDS!

Perfection
Synthetic
FLAT
FINISHES
FOR A FULL RUBBED EFFECT
Without Rubbing

● Perfection Flat Finishes are made by chemically treating fossil gums. This flat is then blended with gloss varnish to give the desired sheen. The result is a water-proof, liquor-proof finish with a beautiful rubbed effect (without rubbing); a perfectly clear finish that brings out all the beauty of the wood and the stain. A full range of sheens.

Perfection
PAINT & COLOR CO.
INDIANAPOLIS 2, INDIANA

piece to the coil; average length 2000 lineal feet.

The enamel to be used is of a formula with very narrow tolerance limits, having a baking cycle of 50 to 60 seconds.

Operation is to be on the following lines: Coil is mounted and fed into painting machine; machine rollercoats in continuous form; painted stock passes through baking tunnel, and take-up reel accumulates painted stock at end of baking tunnel.

We will require several machines, preferably of the multiple-feed type—four or more strips at a time across the rollers.—W. N. Co.

Stop-Off Lacquer Wanted

We require a preparation similar to a "stop-off" lacquer or the like. This material is to be sprayed on to steel in order to mask it so that certain surfaces will not be treated with Bonderite or coated with primer.

This material should dry quickly, resist the mild alkali rinse previous to Bonderizing, stand the boiling Bonderite solution as well as the chromic acid dip following it, take the heat of an infra-red oven, and then be able to be removed easily by means of a trichlorethylene degreaser or, as a second resort, a safe solvent of some sort.

It will be greatly appreciated if you could refer this letter to any sources of this material, or give us any information or leads regarding it.—S. Mfg. Co.

Caskets Finished Metallic

I am interested in knowing the best process and type of material available for the finishing of hardwood caskets in such colors as bronze, silver, light gunmetal, etc.—B. H.

Display Clock Finishes

The Technical Advisory Service of the Smaller War Plants Corp. (created by Congress under the Small Business Act) is endeavoring to assist plant operators in obtaining, from sources especially qualified in their respective fields, solutions to problems that are confronting them. A manufacturer in this area has submitted the following inquiry, and your assistance in his behalf will be appreciated.

"We are interested in getting the latest data on substitutes for nickel, cadmium and chromium plating, in connection with our display clocks which must resist corrosion and also present an attractive appearance. Any assistance you can give us will be appreciated."

Your comments and suggestions will be valued.—S. W. P. Corp.

NON-CRITICAL

★ The critical question of non-critical lacquers is answered by one word . . .

NOVO-LITE

Help the war program by making use of lacquer-type finishing materials made solely from non-critical bases.

NOVO-LITE Gloss
NOVO-LITE Semi-Gloss
NOVO-LITE Flat

. . . are the equal of critical lacquers in working qualities, ease of application, economy of results, and durability and beauty of effect.

Competitive as to price.

Special sample quantity of NOVO-LITE and NOVO-LITE REDUCER sent anywhere at the drum price for trial.

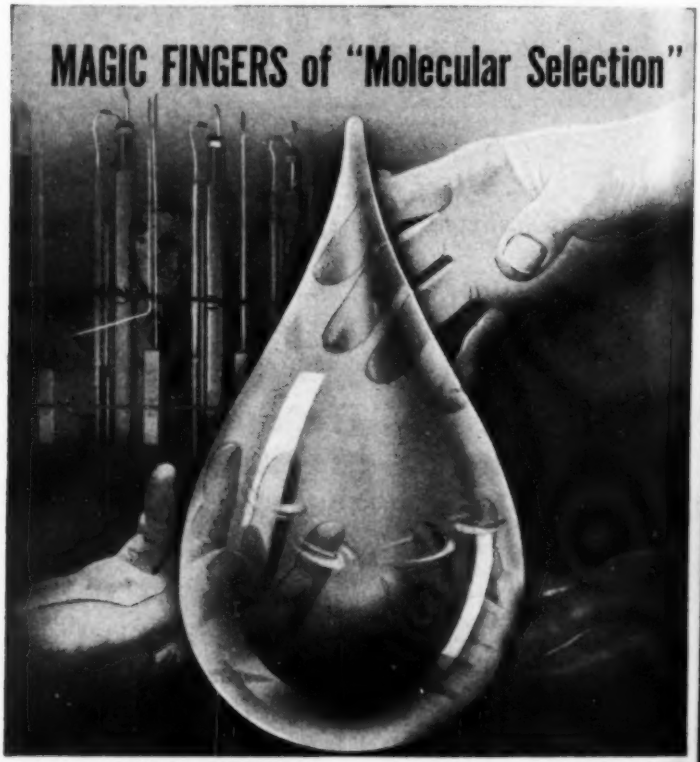
Why not find out? The alert manufacturer is never too busy to consider a better product.

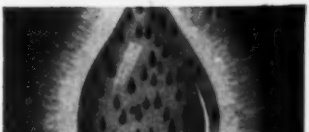
STILLE-YOUNG

MANUFACTURERS: LACQUERS · FILLERS · STAINS · ENAMELS · PAINTS

2300 North Ashland Avenue Chicago 14, Illinois

MAGIC FINGERS of "Molecular Selection"

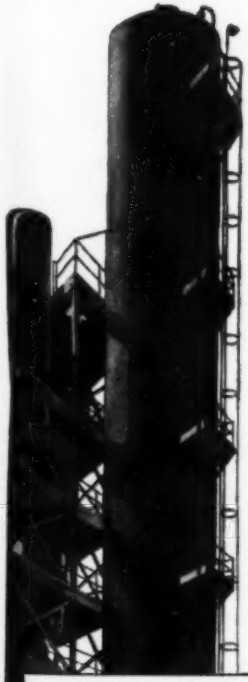




Inside Story of Oil—This diagram shows the "dual nature" of a drop of good quality linseed oil. The dark "droplets" represent molecules that are more valuable for paint-making. The lighter ones are less desirable in a paint film but possess other commercial applications.

Two Oils From One—As if possessed of magic fingers, a special solvent divides each drop of oil and selects the molecules that are most useful for paint making. The result is that two streams of different oils, never before available, flow from the tower. One is an improved drying oil urgently needed for high-quality paints.

Add Exclusive Advantages to Pittsburgh Industrial Finishes



Where Magic Fingers Work

• The only structure of its kind in the world, this 70-foot tower is now converting ordinary oil into a superior drying oil for many Pittsburgh paints and finishes, plus a second oil of value to industries in which its non-drying qualities are an asset.

For the first time, Pittsburgh "unblends" a natural oil to improve on nature's best

IN ANY industrial finish, oil is a vitally important ingredient. Toughness and durability, ease of application and many other desirable features, can all be stepped up *by improving the quality of the oil.* That is why this great advance in oil processing by Pittsburgh offers *direct and immediate benefits* to every user of industrial finishes.

Giant Oil Selector

In a 70-foot tower, natural oil is taken apart as if by magic fingers—and the molecules best suited to paint making are segregated. The result of this "molecular-selection" process is a super-fine oil which greatly improves the drying qualities of Pittsburgh Industrial Finishes. Since this selected oil does not vary in quality like nature's product, uniformity of performance is assured.

War and Paint

This development of "molecular selection" comes at a particularly opportune time. Pittsburgh's war job is to supply *fighting finishes* for many different weapons of war. Thanks to the improved oils now made available, it is possible in many cases to produce finishes that exceed the minimum specification requirements by a considerable margin.

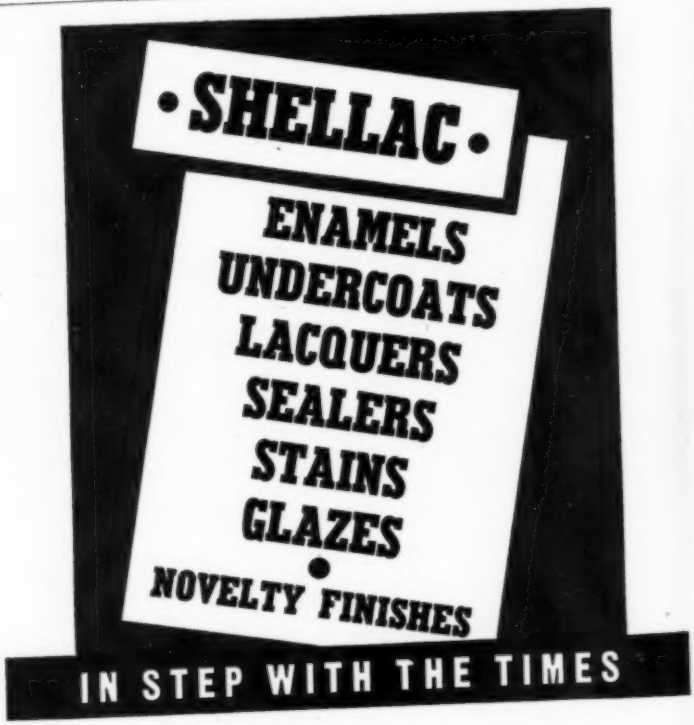
Expert Advisory Service

Our technical men are available for consultation. Their experience in furmulating all types of industrial finishes can often save you time and money.

PITTSBURGH PLATE GLASS COMPANY, Industrial Paint Division, Pittsburgh, Pa.—Factories: Milwaukee, Wis.; Newark, N. J.; Houston, Texas; Los Angeles, Calif.; Portland, Ore.—Ditzler Color Division, Detroit, Mich.—The Thresher Varnish Co., Dayton, O.

PITTSBURGH *Industrial* **FINISHES**

PITTSBURGH STANDS FOR QUALITY PAINT AND GLASS



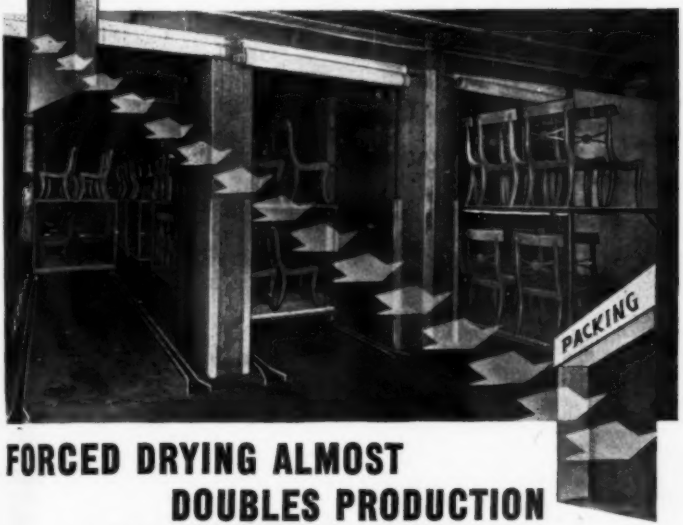
Industrial Finishes
that make the most of available raw materials to give you greatest durability, together with attractive appearance and economy.

• FOR APPLICATION BY ALL METHODS

JAMES B. DAY & CO., CHICAGO

From Mill Room to Packing Room

IN LESS THAN 8 HOURS



FORCED DRYING ALMOST DOUBLES PRODUCTION

FOR THIS MANUFACTURER

Custom-built for one of the South's leading chair manufacturers, this KOCH Forced Drying and Finishing system increases production nearly 100 per cent—to 100 units an hour!

8 OPERATIONS

Chairs are now taken directly from the mill room, put through five finishing operations and three sanding operations—with necessary drying and cooling periods between each finishing coat—and turned out ready for packing and shipping in only eight hours.

UNINTERRUPTED PRODUCTION

KOCH's system of air conditioning and distribution allows uninterrupted production regardless of outside weather conditions.

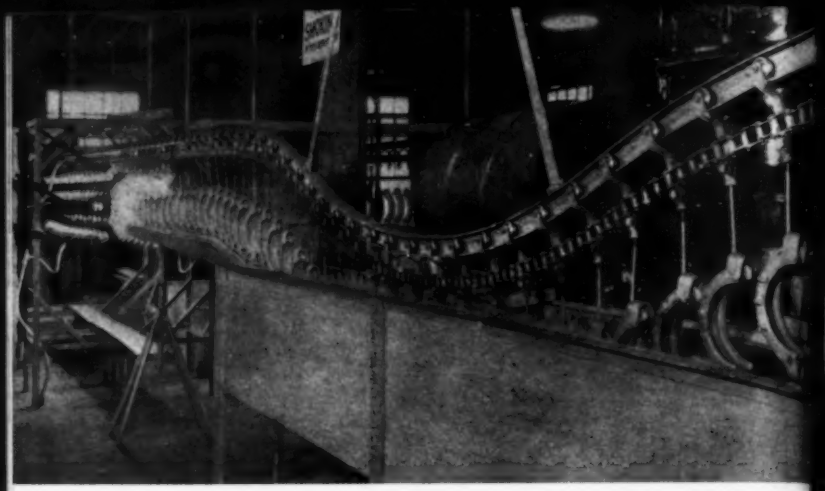
This outstanding installation is another testimonial to KOCH's thorough understanding of forced drying and finishing processes. Let KOCH engineering help increase your plant production!

GEORGE KOCH SONS, INC.

FOR COMPLETE INFORMATION— PHONE, WIRE OR WRITE TODAY!

MAKERS OF *Industrial Equipment*

2118 Pennsylvania Street, EVANSVILLE 4, INDIANA



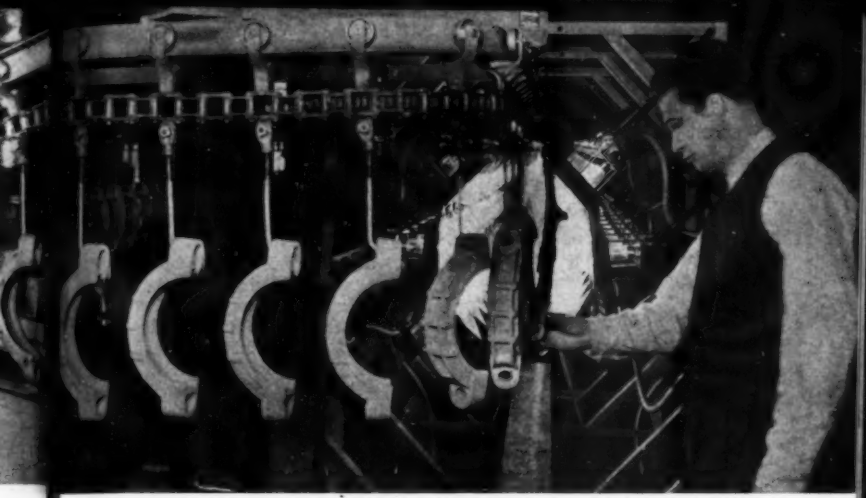
Conveyorized Dipping

CAST steel couplings for portable gasoline and oil pipe lines are among the million different kinds of products being manufactured for military service in the foreign battle zones of World War II. These couplings are vitally essential parts. They are used in the hurried rough-and-ready assembly of portable gasoline and oil pipe lines which must follow along to supply armies on the offensive. Twenty-foot sections of light flexible 4-in. pipe are laid from tankers across beaches and rivers, over deserts and through jungles to advance air fields. Sections of the pipe line are held securely in position by these strong couplings. Naturally the couplings must not fail through rust or corrosion.

Invasion operations have increased the urgent demand for these fittings tremendously so that high speed production is necessary at the factories which produce them. Before these fittings leave the factory they are cleaned and given a hard weather-resistant coating of dull olive drab enamel. This means that the couplings must be carefully cleaned and painted, and the paint coating must be dry before the articles are handled or packed for shipment.

How This Set-up Works

The two accompanying views show parts of a well planned conveyorized production set-up for quickly applying the protective coating by dipping, and then drying the painted surfaces as the conveyor carries the painted work through an infra-red drying tunnel. This interesting set-up includes equipment that can be installed, adjusted, changed, rearranged, adapted to other products, or moved within a short time.



...g and Infra-Red Drying

A dip in the chain conveyor's guide rail allows the work hanging from hooks to pass into and out of a long narrow dipping tank which is partly filled with the protective coating material. The tank can be drained of its contents, cleaned and covered when not in service — this in the interest of cleanliness and safety. Contents of the tank can be agitated, if desirable, when material is being prepared and while conveyorized dipping operations are under way. Tests of the material can be readily made at any time. Everything is in full view and the operations are simplified.

A reasonable space between the exit end of the dip tank and the entrance to the drying tunnel allows that necessary interval of time for the excess paint to drain off, and for the coating on the work to acquire a slight air-dry "set" before the baking begins.

Photographs, Courtesy of The Sherwin-Williams Co.

The banks of infra-red lamps are positioned to form a long narrow tunnel through which the dip-coated work passes for speedy and thorough drying. Infra-red heat is concentrated so closely and with such intensity that the protective coating on the metal dries thoroughly and rapidly from inside to outside—that is from the metal surface to the outer paint surface —which is the ideal condition for the drying of most paint coatings, where maximum adhesion and durability are imperative.

When the manufacturer's contract on this particular product is terminated, the equipment can be immediately adapted to other coating jobs—war work or civilian products—in this factory or else-

where. The sections of conveyor guide rail can be reassembled into a different shaped loop, the dipping tank can be replaced with one of other shape or size, and the tunnel of infra-red lights can be made larger, longer, shorter, or different in shape by shifting the position of the divided sections and by changing the position or number of adjustable holders for banks of infra-red lamps.

Aircraft Parts of Wood, Paper, Plastic

THE PERFORMANCE of the British Mosquito bomber has been a source of pride to the plywood industry, but it is only the most spectacular of various planes fabricated of wood. The sudden expansion of this phase of aviation caught the aircraft designers short of necessary engineering data. As a result, they were obliged to use more material, with consequent greater weight, in order to make certain that they were allowing a sufficient margin of safety. Studies made by the U. S. Forest Products Laboratory, Madison, Wisc., have now enabled them to produce lighter, faster and stronger planes, using substantially less material.

Based upon research at Madison, at least 30 aircraft parts, made of laminated paper plastic, are now in experimental, or full, production. This product is stronger for the purpose than any similar material, and is equal, weight for weight, to aluminum.

Compregnated wood, of a type developed by the Forest Products Laboratory, is now being manufactured into propellers for testing airplane motors. Experimentally, it is being tried for flight propellers. An airplane tail wheel has been successfully molded of this same material.

The Laboratory now is studying the use of compregnated wood as decking for aircraft carriers and for other purposes. The American product has the advantage of much greater stability than an older form, developed in Europe. One of the differences is the fact that the impregnation in the European type does not tend to penetrate the cell-wall structure, while under the American process, resin is formed throughout the cell-wall structure. Postwar uses, the Laboratory is convinced, have great promise.—C. COLLINS.

Becomes Asst. Tech. Director at Watson-Standard

The Watson-Standard Co., Pittsburgh, Penna., announces the appointment of Charles H. Groff, as Assistant Technical Director of the Company's rapidly expanding Research Laboratory staff. Mr. Groff

Charles H. Groff, the new Assistant Technical Director of Watson-Standard's expanded Research Laboratory Staff.

will follow through the many lines of research which are instituted at the Company's Laboratories in Pittsburgh. He comes to his new position from the Research Department of the Crown Can Co., of Philadelphia, where he was Chief Chemist to the Lacquer division.

Mr. Groff is a widely known authority on Organic Research, and is credited with important developments in Lacquers and other industrial protective coatings.

If you have a contract for the Marine Corps or Navy specifying

M.C.G.P.

FLAT GREEN ENAMEL

Murphy No. 6547 is the Answer

We have been making this very enamel for use on Marine Corps equipment for some time—before the war in fact. And in the past 6 months alone, we have supplied M.C.G.P. Flat Green Enamel for the following end uses:

Ammunition Carts	Navy Bicycles	Tanks—Jeeps—Peeps
Windshield Wiper Units	Power Cranes, Shovels	Signaling Searchlights
Motors and Generators	Hospital Equipment	Dredging Equipment
Airborne Radio Equipment	Freight Trailers	Aircraft Heater Units
Distillation Units	Rear-vision Mirrors	Spraying Equipment
Fans, Blowers, Exhausts	Fire Extinguishers	Radar and Radio Units
Clearing & Grub Equipment	Water and Fuel Pumps	Machine-gun Mounts

The latest revision for M.C.G.P. Flat Green Enamel calls for infra-red reflectent properties, which we are able to supply. M. C. Oxide Metal Primer, G. P. Type SE-139, is likewise available.

Why not plan now to use Murphy No. 6547 on your Marine or Navy contracts?

Further information on request

MURPHY VARNISH COMPANY

NEWARK SAN FRANCISCO CHICAGO

MURPHY

Protective Coatings

Lockheed Requirements for Protective Coatings

BY MAXWELL STILES

THERE are some definitely defined and rigid requirements at Lockheed Aircraft Corp., for the processes to be used in finishing aircraft parts. These are drawn up by engineers or other technicians and handed down to the finishing departments so that men and women working in these departments are never in doubt as to what kind of treatment is to be applied where, and when, and in what continuity, and at what strength, or for how many seconds or minutes.

There are, for example, requirements for organic finishes — in general, paints of all types. There are requirements for plating of aluminum and its alloys, cadmium, chromium, etc. These are referred to as inorganic.

Before going into a discussion of finishes, let me review a number of general requirements.

Inorganic surface treatment is required for all parts and surfaces before application of any paint-type coatings.

Before the application of any inorganic surface treatment or paint-type protective coatings, the surfaces must be cleaned in accordance with requirements as outlined in my previous articles in INDUSTRIAL FINISHING Magazine. Surfaces must be dry at the time of the application of any paint-type finish. The initial paint coating is applied immediately after cleaning, plating or chemical treatment. The final paint coating, when required, is applied after assembly, wherever practicable.

All welding and brazing are done before the application of either organic or inorganic finishes. Wherever practicable, all forming, cutting and machining is done before application of the required inorganic surface treatment.

Zinc Chromate Primer; Its Purpose and Proper Thickness

Wherever a finish consisting of a 2-coat protection is specified, the initial coat is zinc chromate, and the second may be either plain or aluminized zinc chromate primer, lacquer or synthetic enamel. This requirement does not apply in cases where specific finishes are required.

One coat of zinc chromate primer is required prior to the application of any other paint-type material, with the exception of wrinkle enamel. The primer coat is touched up, if necessary, to form a continuous primer film before application of top finish coats.

The first primer coat is intended principally as a base for subsequent type coatings and should be applied to form in a thin film. The weight of one coat of primer (one side only) thoroughly dry, should approximate ½-oz. per square yard. The color is a good indication of the film thickness. The proper film thickness is indicated by a yellow gray color, while

ZAPON

FINISHES

WAR-TESTED FOR PEACE

Zapon finishes have been war-tested on the "firing line" — in the heart of the steaming jungles and the cruel cold of arctic blasts. They will be available to serve you equally well on your products after the war.

Specification finishes do not always have to be the best, either because of the needs of the job or because of material shortages. Zapon research, however, has met the rigid military specifications for *special* finishes, though at times it has been forced to utilize alternate materials due to scarcity. But *the Zapon way* is to use the best of materials, often going beyond the individual manufacturer's requirements by providing finishes of extra value.

Zapon emphasizes that in the world of tomorrow it is prepared to solve even more complicated problems born of specific needs by manufacturers.

We are now in consultation with many manufacturers to meet postwar problems. We suggest that you, too, consult us *now* about your plans for the future.

ZAPON DIVISION ATLAS **ATLAS POWDER COMPANY**

Eastern Sales: Stamford, Conn. Western Sales: No. Chicago, Ill.

INDUSTRIAL FINISHES . . *For Your Products of Tomorrow*

BARRAGES

Sor BOMBERS

DeVilbiss Guns help keep shells and ships flying

• Keeping the air over our enemies filled with shells and bombers is another way DeVilbiss Spray Systems are hurrying the Axis' downfall.

With lightning-like speed a DeVilbiss Automatic Machine at Mullins Mfg. Company coats the inside of 105 mm. shell cases to protect the metal against the chemical reaction of the charge. And a DeVilbiss Gunner at Willys-Overland maintains a fast production pace in giving landing gear struts essential paint protection against rust.

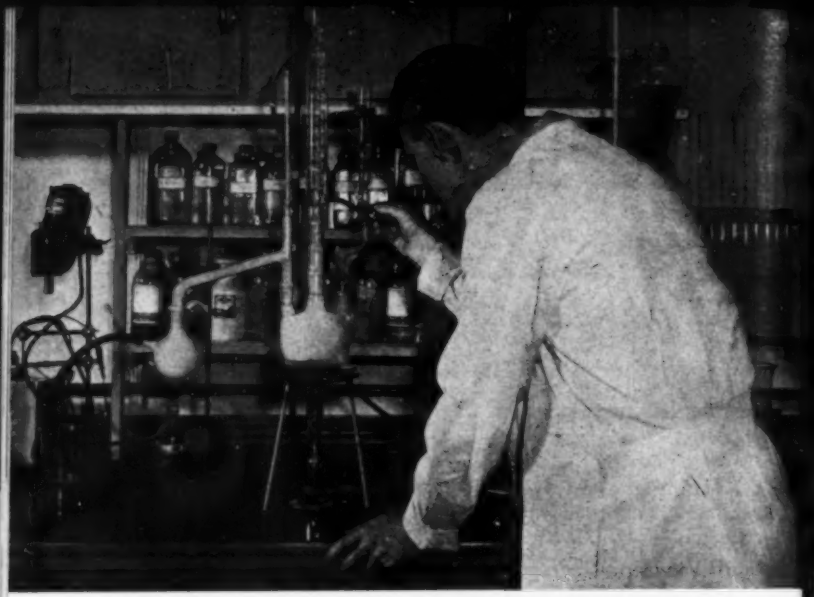
Shells and landing gears are strictly war products for these firms. But these modern DeVilbiss Systems have the facilities to meet postwar needs—easily and economically. Individual units are designed for peak performance either alone or with various combinations of other parts.

Ask a DeVilbiss spray expert to show you how the latest types of DeVilbiss Equipment can help boost your war production for Victory—and give your plant the inside track to better postwar finishing.

THE DEVILBISS COMPANY • TOLEDO 1, OHIO
Canadian Plant: WINDSOR, ONTARIO

DE VILBISS
Spray Systems

SPRAY EQUIPMENT • EXHAUST SYSTEMS • AIR COMPRESSORS • HOSE AND CONNECTIONS



Finishing processes are developed and tested before the design of a plane is complete at the structures research laboratory. The variety of localities in which our airplanes are used necessitates rigid specifications for finishing.

primer films of excessive thickness will produce a bright yellow color.

Parts fabricated from 17S or 24S aluminum alloys must not be subjected to a temperature above 180° F. for drying the paint.

In general, interior surfaces are given a 2-coat protective finish, with the exception of magnesium alloy surfaces. In these instances at least one additional coat of either primer or lacquer is required.

Protective Coatings for Interior Surfaces

One coat of primer, followed by at least one coat of colored or aluminized lacquer or enamel to match the surrounding color scheme, is prescribed for surfaces comprising the passenger, armament, bomb and baggage compartments (except the lining for the baggage compartments), main plumbing, fins and stabilizer.

Interior surfaces of integral tanks receive one continuous coat of zinc chromate primer.

For Exterior Surfaces; Customer's Specifications

The customer specifies the color of exterior finishing coats, and the color and location of insignia and markings. These normally consist of two coats of lacquer or enamel, in addition to the initial primer coat.

Exterior surfaces, fabricated from stainless steel and aluminum alloys 2S, 3S, 52S, 53S and all Alclad, require paint-type finishes only when specified by the procuring agency. Exterior surfaces fabricated from other materials receive one coat of primer, fol-

(Continued on page 24)

Resourcefulness

● Finding better ways to do things has been a feature of Glidden service for many years. A probing, restless impatience with ordinary materials and methods has brought some truly remarkable advances in paint and enamel finishes from Glidden laboratories. It's become a Glidden habit. Since America's entrance into the war it has led to an ingenious use of non-critical materials in the development of wartime finishes actually superior to prewar products.

Perhaps this Glidden resourcefulness can be of service to you. The accessibility of eight strategically located factories and research laboratories makes it available to you overnight wherever you may be.

Glidden is prepared to supply any finish required by government bids or contracts. You are invited to test Glidden *resourcefulness* in meeting your particular war and postwar requirements.

THE GLIDDEN COMPANY
CLEVELAND 2, OHIO

TIME-TESTED

NUBELITE

Nubelite is a carefully blended combination of liquid plastic, heated at pre-determined temperatures to produce a protective surface unequaled for beauty, toughness and durability.

Its unusual resistance to fruit acids, grease, heat, sunlight and salt laden humidity, makes Nubelite a preferred finish for stoves, metal cabinets, refrigerators and household appliances.

Backed by ten years of widely varied use, Nubelite is a *Time-Tested* Glidden product that merits your serious consideration. Ask for a demonstration.

GLIDDEN *Pacemaker in Paints*

lowed by two coats of colored or aluminized lacquer or enamel to match the surrounding surfaces.

Four-coat finishes, consisting of two coats of primer followed by colored or aluminum lacquer or enamel to match the surrounding surfaces, are specified for magnesium alloys constituting exterior surfaces.

A protective shop-coating of zinc chromate primer or suitable varnish or lacquer-type material may be applied to the exterior of external skin sheets if desired.

Treatment of Surfaces at Joints and Seams

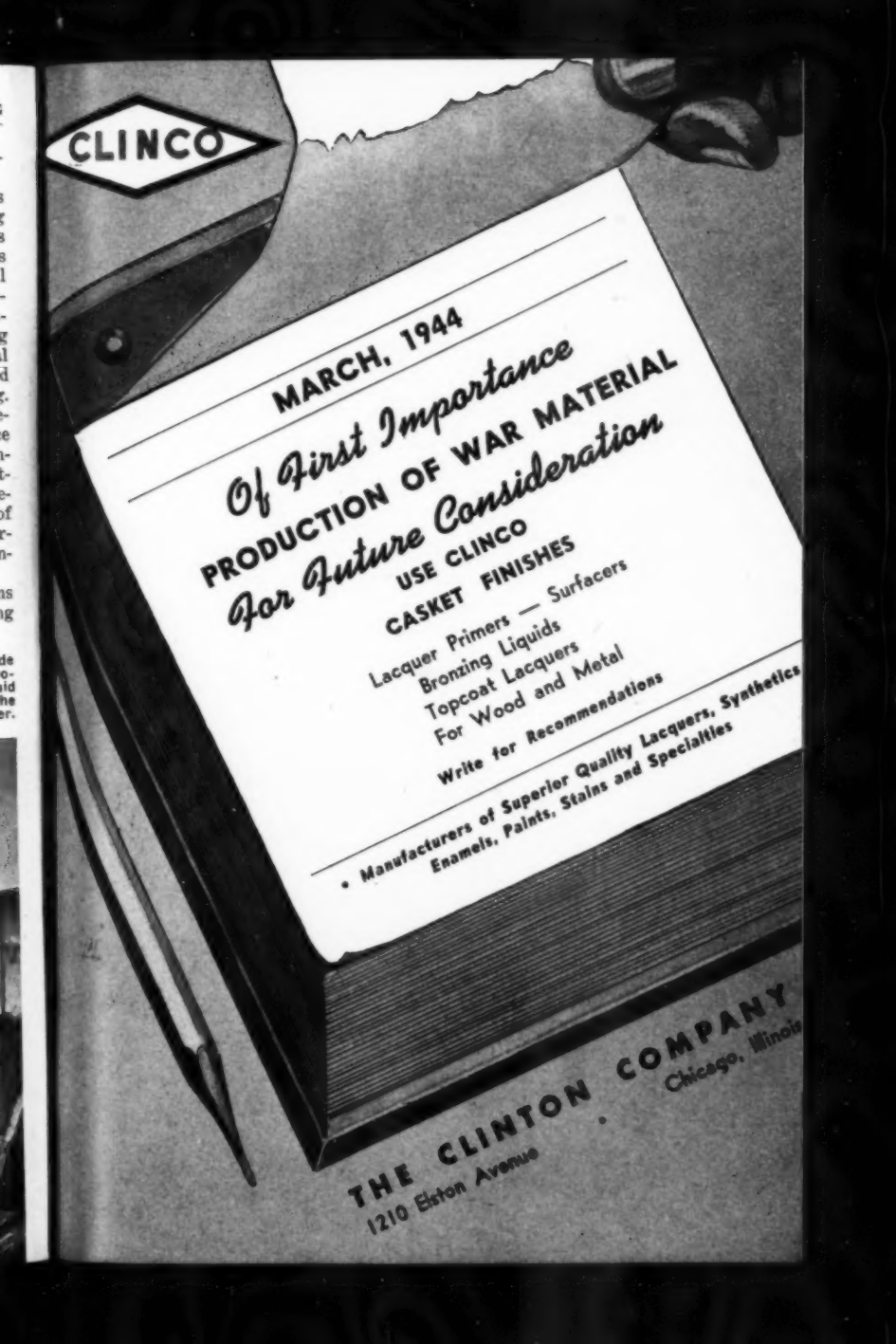
With the following exceptions, the overlapping portions (surfaces in contact) receive a 2-coat protection on each surface. The first coat is zinc chromate primer; the second is plain or aluminized zinc chromate primer, lacquer or synthetic enamel.

Exceptions are: 1) Terminals for electrical, radio or bonding connections, or parts or surfaces or portions thereof which act as electrical conductors, including all faying surfaces or parts composing junction box units, and miscellaneous standard attaching parts which serve as electrical conductors. 2) All parts joined by welding, brazing or soldering. 3) Aluminum alloy parts that receive anodizing or other surface treatment after assembly. 4) Contacting portions of attachment fittings that act as connections between various main components of the airplane. 5) Contacting surfaces between heat and corrosion-resisting iron and steel alloys.

In locations where tight seams are desired, zinc chromate sealing

(Continued on page 28)

Vapor degreaser in tube bending section at Lockheed. Tubes coated inside with grease from the bending operation are immersed in boiling trichloroethylene, then suspended in the 18-in. vapor layer above the boiling liquid until clean. At extreme right, the continuous still removes the grease from the solvent and returns clean trichloroethylene to be used in the degreaser.


CLINCO
MARCH, 1944
Of First Importance
PRODUCTION OF WAR MATERIAL
For Future Consideration
USE CLINCO
CASKET FINISHES
Lacquer Primers — Surfacers
Bronzing Liquids
Topcoat Lacquers
For Wood and Metal
Write for Recommendations
• Manufacturers of Superior Quality Lacquers, Synthetics
Enamels, Paints, Stains and Specialties
THE CLINTON COMPANY
1210 Elston Avenue
Chicago, Illinois

Giant

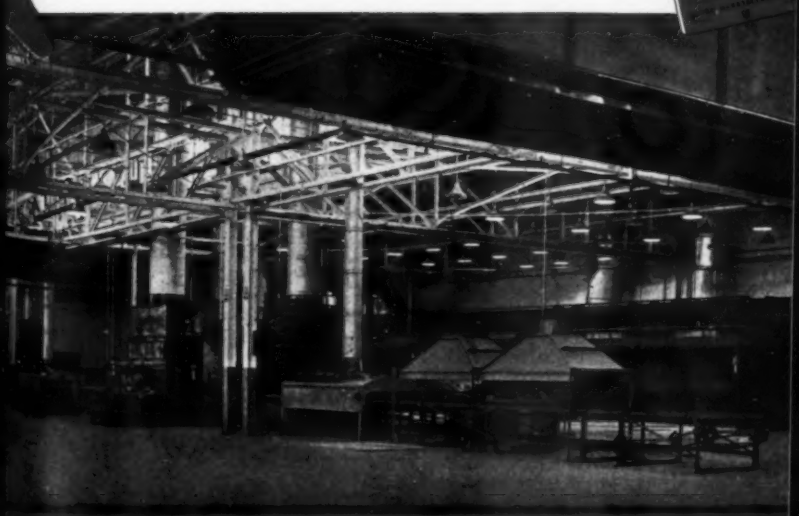
FINISHING DEPARTMENTS FOR GIANT BOMBERS . . .

A three-tier Binks Water Wash Spray Booth now in use finishing giant bombers

WHEN BINKS ENGINEERS designed and installed the giant water wash spray booth to the left in one of the country's largest plane plants, it was only one part of a complete finishing department. To finish the countless small parts that make up the finished plane, a complete small parts department was included. The views to the lower left and below illustrate the comprehensiveness of this Binks Spray finishing installation. Clean, fresh air is delivered to this department in slightly greater quantity than it is exhausted, thereby eliminating the problem of dust and dirt filtering into the room. Every piece of equipment is engineered for speedy, high-quality finishing.

Because of the highly important part that Binks has played in speeding up American war production while maintaining quality, Binks will be in a better position than ever to service American industry after the war. In making your postwar plans, remember that Binks can help you save time and money where spray finishing is concerned.

SEND TODAY FOR BINKS CATALOG-DATA BOOK



BINKS MANUFACTURING COMPANY

[illegible] CARROLL AVENUE, CHICAGO [illegible], ILLINOIS

[illegible] LOUIS - MILWAUKEE - BOSTON - LOS ANGELES - SEATTLE - WINDSOR, ONTARIO, CANADA

Moving a load of parts to be given the Dow No. 7 sodium dichromate treatment.

compound may be used over the initial primer coat in lieu of the second finishing coat.

Insulation to Prevent Direct Contact of Dissimilar Metals

Metal to metal contact of dissimilar metals is prevented by the application of the required inorganic surface treatment, followed by paint-type coatings as previously described. Contact of corrosion-resisting iron or steel alloys with dissimilar metals is prevented by two coats of finishing material on the dissimilar metal.

Unless otherwise specified on the drawing, it is not necessary to apply zinc chromate primer to the contacting surface of nuts, bolts, washers, rivets and similar items, prior to assembly, provided the metal parts assembled with such standard parts have been protected previously with zinc chromate primer — and further, provided that the exposed surfaces of such standard parts are to be protected subsequently by paint.

Neoprene tape or fabric must not be used for insulation between dissimilar metals.

The requirements for dissimilar metal insulation do not apply to threaded connections, push or press fits, or to bolts, nuts and washers used for electrical or bonding connections, with the following exception: Unplated brass or bronze bushings that are pressed into fittings of a dissimilar metal are insulated in wet primer.

Wood surfaces in contact with metals are finished in accordance with the requirements for wood (see later) and the metal surfaces receive the required surface treatment and paint before assembly.

Much of the furniture aboard our Navy and Maritime ships is finished with Johnson's Wax-O-Namel. Because it contains genuine wax, this durable, hard-drying, scratch-resistant enamel does a better job of protecting chairs, tables, berths, mess benches, log desks, etc. from hard wear and abuse.

Wax-O-Namel more than meets Navy specifications. It has remarkable ability to stand up under punishment. And in production, Wax-O-Namel assures trouble-free performance. It is easily and economically applied either by spraying or dipping, and can be cured in conventional ovens or infra-red drying banks.

Perhaps Johnson's Wax-O-Namel is the answer to some of *your* finishing needs. We will be glad to send you complete Wax-O-Namel information — write us today.

TODAY Wax-O-Namel provides extra protection for war equipment.

TOMORROW Wax-O-Namel will provide extra protection and new beauty for peacetime equipment.

Let's ALL BACK THE ATTACK . . .
Buy ANOTHER War Bond!

S. C. JOHNSON & SON, INC.
PRODUCT FINISHES DIVISION
Department IF-34
Racine, Wis.

Special Treatment for Threaded and Bearing Surfaces

Threads on adjustable parts, which are disconnected or disassembled, are greased before assembly. The use of some product like Paralketone, Threadlube, etc., is recommended. Miscellaneous steel parts which are to be subsequently welded, or parts which do not require plating or painting, are generously coated with grease or rust-preventive compound. Care should be exercised to prevent the application of paint materials to wearing surfaces, threads and oil holes.

Surface Treatment of Aluminum and Aluminum Alloys

All aluminum and aluminum alloy parts that require paint-type protective finishes, and which are fabricated from 2S, 3S, 52S, 53S or Alclad, receive a surface treatment of either a hot chromic acid (chromodizing) or phosphoric acid, except coolant lines fabricated from aluminum or its alloys, which are anodized. In general, chromodizing is preferred to the phosphoric-acid treatment.

Wherever practicable, parts requiring surface treatment are treated in detail before assembly. In cases where detail treatment is impracticable, it is permissible to treat assemblies by the chromic acid method, but not by phosphoric, provided that:

1) Magnesium alloys do not form a part of the assembly.

2) Wherever practicable, parts that are treated as assemblies receive the required primer coat subsequently by the dip process rather than the spray process.

3) The assembly is an integral unit in the structure and is not subject to breakdown or disassembly in service.

4) The assembly is so situated in the airplane as not to come in direct contact with moisture.

5) Joints and faying surfaces do not contain organic materials, insulating fabric or compounds subject to deterioration in the acid bath.

6) Non-metallic materials do not form a part of the assembly, an exception to this requirement being made in the case of self-locking nuts containing fiber inserts.

7) The final organic protective coating forms a continuous unbroken film.

Aluminum alloy parts to be spot welded receive the required surface treatment after the welding operation, except where spot-welding seam compound has been applied to the faying surfaces previously mentioned. Wherever practicable, parts that have been previously assembled by spot, seam or roll welding are primed by the dip method.

Anodic Treatment for Aluminum Alloys

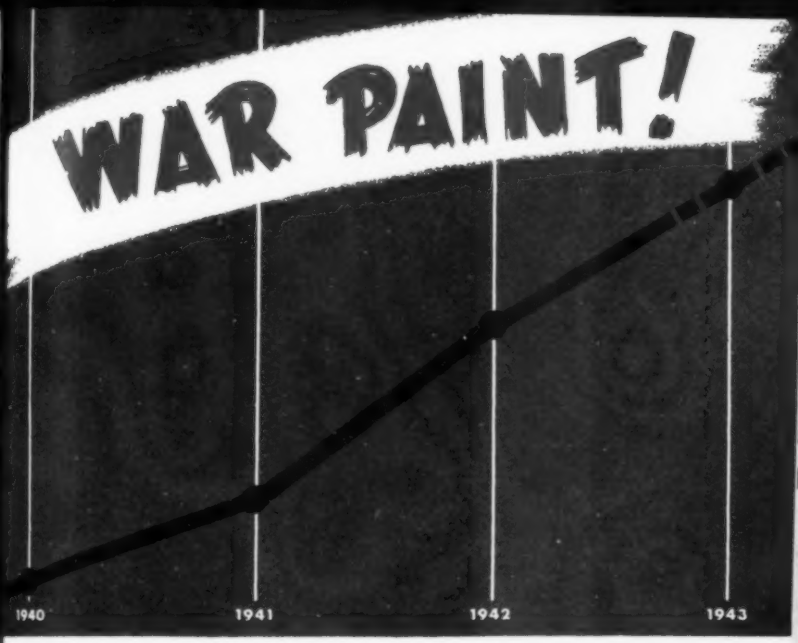
Anodizing is not substituted for chromodizing on external skin sheets of unpainted airplanes. All aluminum alloy parts that are fabricated from alloys other than 2S, 3S, 52S, 53S and Alclad, are anodized in accordance with Lockheed specifications, except:

A) Plumbing lines; electrical conduit and flexible tubing.

B) Electrical parts such as connectors and plugs that are required to act as conductors for bonding or shielding.

C) Alloys containing in excess of 5% copper, which are unsuitable for anodization.

Except in the case of welded parts, those parts requiring the anodic treatment are treated in



How an IDEA grew into a BUSINESS

Starting from scratch less than five years ago, the Liquid Plastics Division of Ferro has grown into a thriving "specialty" business.

We call it a specialty business because we produce only *industrial* finishes, each individually made for a specific use. In short, we start with *your* product . . . and *your* finishing setup . . . then develop a durable finish exactly suited to the job.

That this idea has "clicked" would seem to be borne out by the rising sales curve shown above.

Vedoc

LIQUID PLASTICS DIVISION

FERRO ENAMEL CORPORATION

CLEVELAND 5, OHIO

detail before assembly. In cases where treatment of detail parts is impracticable, treatment of assemblies is permitted provided that no dissimilar metals (other than aluminum and aluminum alloys) are present in the assembly and that other restrictions noted heretofore are met.

Aluminum alloy castings containing integrally-cast non-aluminum metal inserts are chromodized in lieu of anodization prior to the application of paint coatings.

Treatment of Magnesium

All magnesium alloys receive, prior to the application of paint-type coatings, a chemical protective treatment in accordance with the requirements of a Lockheed process specification.

Acid, Alkali-Resisting Paint

Surfaces other than battery compartments, which are subject to spillage of acids or alkalies such as certain portions of the lavatory compartment, receive two coats of an approved acid and alkali-resisting paint. All surfaces of the battery containers that are subject to acid spillage or spray are protected by two coats of black acid-proof lacquer.

Protective Coatings for Cables and Fittings; Compartments

All steel cables are coated by immersion in a molten solution of rust-preventive compound for a minimum of two minutes. After installation, they are coated lightly with the same material.

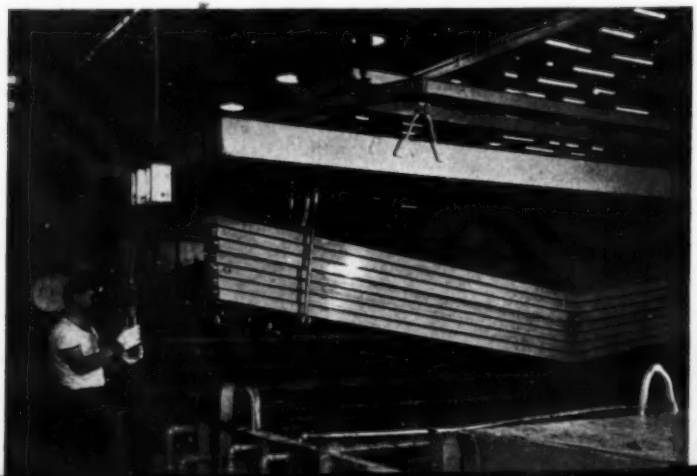
Cable fittings, except those fabricated from corrosion-resisting iron or steel alloys or K-monel, are protected by two coats of aluminized baking varnish wherever practicable. In locations where it is impossible to apply the baked finish, the fittings are protected with one coat of primer followed by two coats of aluminized lacquer.

Turnbuckle barrels are not required to be cadmium plated or painted.

In liquid-tight and air-tight compartments, all joints and seams are protected in accordance with

(Continued on page 38)

Operating electric hoist to lift heavy load of treated parts from anodic tank.



. . . in this MAHON Spray Paint Installation

Here is a modern, gas-fired heating and ventilating system—designed, built and installed by Mahon engineers for the paint room of one of the leading aircraft manufacturers—that attains the *nth* degree in automatic operation. It has been so engineered that by merely pressing the "START" button—the entire system is set in operation. Pressing the "STOP" button shuts the complete system down. That's how simple it is. By means of a series of time delays and Mahon Air-Flow Switches, the various units go into service, each in its proper sequence. First, the air supply fans start—the four A.O.P. surface combustion gas heaters ignite—and air, drawn from outside, is heated to 80° F., thoroughly filtered, and distributed throughout the room. Next the spray booth pumps and fans go into action—the conveyors begin to roll—and the complete system is in operation—all in about a minute's time. Ovens, also, can be hooked in, if desired.

A Mahon engineer will be glad to explain the set-up in detail—and show you how automatic Finishing Equipment can be developed to fit YOUR specific requirements.

THE R. C. MAHON COMPANY
DETROIT CHICAGO

Manufacturers of Metal Cleaning Machines • Rust Proofing Machines • Hydro-Filter Spray Booths • Ovens of All Types • Filtered Air Supply Units • Hydro-Foam Dust Collectors—and Many Other Units of Special Production Equipment—Including Complete Finishing Systems

ARMORED against MORE than the Axis!

Finished to Fight Corrosion with Sherwin-Williams Products

● Army tanks, made by American Car and Foundry, are two-fisted fighters. Built to fight . . . built to win! But there's more than the enemy to beat. *Rust*, first of all! This saboteur strikes on all fronts . . . on open flat cars rolling to embarkation points, in salty holds of freighters, and on the field of action. For surest protection, American Car and Foundry Company uses Sherwin-Williams Industrial Finishes.

CRASHING THROUGH JUNGLES *and plowing through mud are tough on the finish of light combat tanks like these.*

Photo by Army Signal Corps

SHERWIN-WILLIAMS

DEMOLITION BOMBS, *made by A-C-F, are sprayed with Sherwin-Williams Finishes. Acid-proof inside finish provides vital protection against spontaneous combustion that could result if high explosive touched uncoated metal.*

SOMEWHERE IN THE SOUTH PACIFIC . . . *Coast Guardsmen lower this tank over the side—preparatory to landing at a nearby island beach. Sherwin-Williams Finishes are on the job, providing sure surface protection as U. S.*

A-C-F uses S-W Finishes for PLUS protection against Rust . . . Wartime Saboteur No. 1

Sherwin-Williams finishes for tanks, built by American Car and Foundry, meet performance and production demands on all counts! These finishes provide *plus* protection . . . in transit, in combat. Equally important, they guarantee *low* unit-cost, *high* output.

A-C-F also use Sherwin-Williams Finishes for spraying aerial bomb cases. Acid-proof and corrosion-proof, the inside finish for 1000-lb. Demolition Bombs is a vital factor in preventing premature combustion!

Industrial finishes today have a bigger job to do than ever—one reason why more manufacturers use Sherwin-Williams products. They depend on Sherwin-Williams paint engineers for latest approved finishes . . . and for fast, economical finishing procedures! The Sherwin-Williams Co., Cleveland 1, O.

INDUSTRIAL FINISHES

Only Two of the

MANY EFFECTIVE USES *for*

REMOVAL OF MAGNAFLUX

REMOVAL OF LAPPING COMPOUND

TRIAD WATER-EMULSION CLEANERS

New developments in these water-emulsion cleaners have brought a much wider range of cleaning to many plants having varied production requirements.

GUARANTEED PERFORMANCE

All Triad Emulsion Cleaners are shipped on a guaranteed performance basis for thorough test on your production.

A few of the applications include:

- ★ Cleaning machined parts in washers for inspection and temporary rustproofing.
- ★ Removal of Magnaflux after inspection.
- ★ Removal of buffing, burring and lapping compounds.
- ★ Removal of pigmented drawing compounds.

Any type or combination of metals may be cleaned in Triad Emulsion cleaners. Solutions are used at temperatures up to boiling, and at working concentrations are free of fire hazard. Surfaces cleaned and dried are suitable for painting.

A test run in your plant may solve that cleaning problem which has given you trouble.

DETREX CORPORATION

13019 HILLVIEW AVENUE • DETROIT 27, MICHIGAN

THE BEST INVESTMENT IN THE WORLD IS IN THIS COUNTRY'S FUTURE—BUY WAR BONDS

MAKE A START TODAY

for a WINNING FINISH TOMORROW

One of your major postwar problems is the right finish for the products you will offer to a waiting world. Perhaps we can work with you and help you arrive at a solution which will speed your sales and cut your manufacturing costs.

Many firms have already dropped their ideas for postwar finishes into our ample laps. Wouldn't it pay you to take full advantage of the Reliance planning and engineering service which is at your command, without obligation? Postcards reach us!

RELIANCE VARNISH CO., INC.

LOUISVILLE, KY. CHICAGO, ILL.

Rely on Reliance

a Lockheed process specification. Brass, copper, corrosion-resistant steel and cadmium-plated steel parts in the engine compartment (forward of the firewall) need not be painted. No paint is applied to either side of the firewall or to the interior surfaces of aluminum alloy engine cowling, except at faying surfaces.

Attaching parts are insulated at the faying surfaces unless they act as bonding connections.

For Junction Boxes; Liquid Lines and Tubing

No paint coatings are required on junction boxes, except where, for reason of appearance, they are required to match the adjoining color scheme.

Liquid lines and conduit tubing in the engine and accessory compartments, and in other locations where they are readily accessible, are not required to be primed or painted. No paint is applied to interior surfaces of liquid lines. Flexible tubing carrying liquids, rubber tubing and ignition shielding harness are not painted. Flexible aluminum alloy tubing is not anodized, chromodized or painted. But all coolant lines fabricated from aluminum or aluminum alloys receive an anodic treatment.

The interior surface of all closed or sealed steel parts or similar structures are protected by a coating of raw linseed oil or rust-preventive compound. After welding, the liquid is applied by forcing it into the hollow member under pressure. The liquid must be at a temperature of not less than 160° F. when applied, and is allowed to remain in the member for not less than two minutes. The vent holes should be drilled in regions of lowest fiber stress near the ends of the members to insure complete diffusion of the oil and to prevent structural weakness.

After soaking, the member is thoroughly drained, wiped free from oil, and all oil holes are sealed by cadmium-plated drive screws which have been coated previously with zinc chromate seam-sealing compound, or have been dipped in zinc chromate primer just before driving.

The exterior surfaces of closed or sealed steel parts receive a protective finish consisting of two coats of primer followed by two coats of colored or aluminized lacquer or baking enamel.

The interior surfaces of all hollow and tubular parts or members which are open ended are given a coat of primer applied by filling and draining, or by dipping.

Ornamental Finishes. Surfaces to which wrinkle finishes are applied, such as instrument panels, control stands, equipment cases, etc, are not required to be primed before the application of wrinkle enamel finish. Wrinkle finished parts are baked in accordance with the recommendations of the material manufacturer.

Plastics. Glass, rubber, and rubber-like parts and surfaces are not painted or greased. Phenolic materials or similar plastics may be painted to match adjacent surfaces if desired. Rubber or synthetic-rubber plastics are not baked or placed in chemical or electrochemical treating baths.

Wood Surfaces. Wood surfaces, including plywood, receive at least two coats of wood sealer followed by one coat of spar varnish or colored aluminized lacquer or enamel, depending upon the color scheme. Wood sealer or paint-type coatings are not applied to surfaces which are to be glued.

A VERSATILE FINISH FOR THOSE POSTWAR PRODUCTS ! !

IT'S

WRINKLE

FINISH

WRINKLE offers postwar possibilities far beyond ordinary finishes. Its variations in texture are unlimited. Its toughness and resistance to the elements mean surface protection at its peak. Its general appearance adds distinction and eye appeal to any product. Write for current NEW WRINKLES IN FINISHING giving the latest facts on WRINKLE

Billy Wrinkle Says

"Send us a sample of your product, or if that is out of the question, a piece of the material to be finished. WE WILL PROVE TO YOU that WRINKLE belongs on your product."

NEW WRINKLE INC.

314 W. FIRST ST. · DAYTON 2, OHIO

Coat the bottom of Card Index Files with

Cellusuede FLOCK

Another of the countless ways in which Cellusuede Flock may be used to give a product a smooth non-scratching base and a quality finish that adds to its value.

Cellusuede Flock is easily applied to wood, metal, glass, paper or cloth with a spray gun or by sifting.

Rayon and Cotton Flocks are supplied in one pound bags, twelve to a case, solid or assorted colors. Also supplied in 10 and 50-pound bags. Wide variety of colors.

Write for color card, samples and prices.

CP *Cellusuede Products, Inc.*

ROCKFORD, ILLINOIS

Survey of Methods for Cleaning Metals

Brief non-technical article on solvent cleaning; degreasing self - emulsifying compounds; alkali cleaners; care of power washers; removal of scale by blast cleaning, by pickling and by different burn-off methods.

BY J. M. BIALOSKY

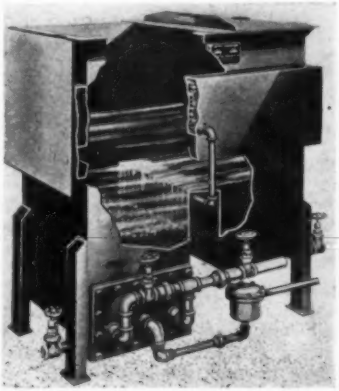
PROPER cleaning is the first step in the application of any protective or decorative coating on metals. If this first step is not correctly carried out, the finish will not be satisfactory, regardless of the care taken on subsequent operations. The choice of methods and materials used is dependent upon the type of soil that must be removed, and the finish to be applied.

For organic finishes, a physically clean surface is required. This means the complete removal of oil, grease, loose scale, dirt and dust. For electroplating, a chemically clean surface, which is clean, bare metal, is required. Such a surface will rust or oxidize quickly, and parts cannot be stored in this condition.

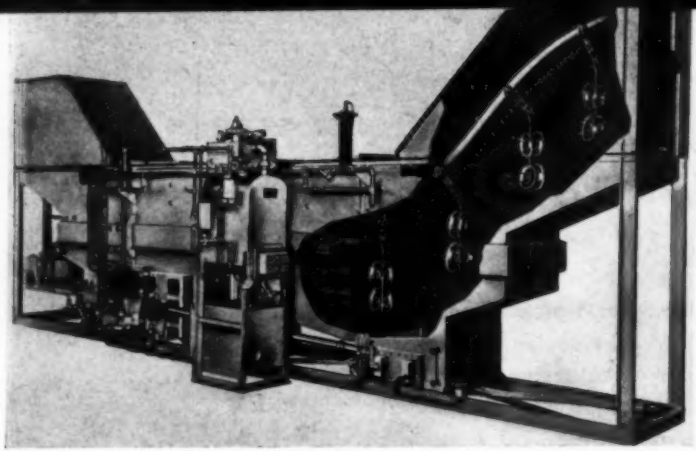
Solvent Cleaners

The petroleum fractions—kerosene or naphtha—are widely used as cleaners, since these materials are quite readily available. The surfaces to be cleaned are usually hand-wiped or brushed with the solvent. For satisfactory results, the work should be given a rinse with fresh solvent. This method removes grease, oils and dirt. This type of cleaning can be obtained with automatic conveyor-type machines, in which the solvent is sprayed over the work. No heating of the solvent is required, but extreme care must be taken, due to the inflammable nature of the materials.

If a clean solvent rinse is not used, a thin film of oil will be left on the surface of the piece. This



Cutaway section of vapor-degreaser, with hot solvent dip, cold solvent dip and vapor rinse; okay for hand operation. Photo, Detrex Corp.



Conveyorized degreaser with modern type of vapor rinse, solvent spray, and vapor rinse sequence. Photograph supplied through courtesy of Detrex Corp.

film will protect the work from rusting if it is stored in this condition. This oil film must be removed prior to painting, in order to secure good adhesion.

Degreasing Machines; Chlorinated Solvents

Chlorinated solvent cleaning machines are called degreasers. These machines are designed for various cycles of operation. These may include any of the following: vapor rinse, cold solvent dip, hot solvent dip, or solvent spray.

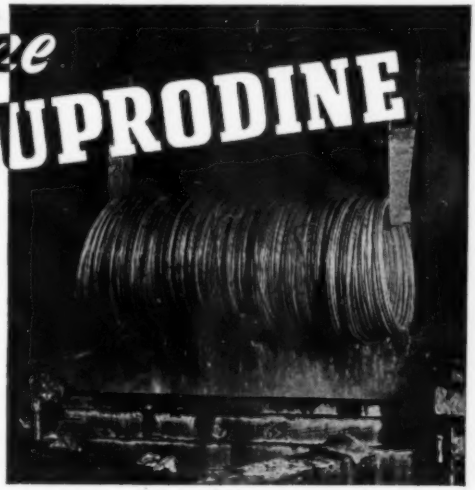
Vapor rinsing is accomplished by passing the cold work through a chamber filled with the solvent vapor produced by boiling. The vapor condenses on the cold work and runs off, giving a thorough rinsing action. This action continues until the temperature of the metal reaches the temperature of the solvent vapor. If only light oil is present on the metal, the vapor phase alone may be sufficient to clean it. Where heavy deposits or dirt are to be removed, a dip or spray will be required, in addition to the vapor rinse. This type of cleaning will not completely remove all dust from the surface, but the dust can be readily eliminated by a dry wiping or brushing, since the oils which hold the dirt to the surface have been removed.

Work delivered by the degreasing machine is hot and dry, and can be painted at once. These machines will handle a large volume of material per hour, without constant chemical or physical control. Degreasing machines are widely used for high speed large production installations, although smaller models are economically used where conditions are suitable.

Self-Emulsifying Cleaners

Self-emulsifying cleaners are organic compounds which are mixed with kerosene in the ratio of one part cleaner and five to nine parts kerosene. The work is immersed in the mixture for sufficient time to completely wet the grease and soil present. It is then removed and the excess compound is allowed to drain back into the tank. A stream of water is then directed on the work and the compound forms an oil in water emulsion

Cuprodize with CUPRODINE



for:

- **MORE DRAFTS** *Increased Production*
- **LONGER DIE LIFE**
- **LESS METAL PICKUP**
- **LESS SCRATCHING AND BREAKAGE**

Cuprodine is more than a lubricant—it is a chemical which reacts with the steel dissolving such minute quantities as are necessary to form a thin, adherent copper coating.

Cuprodizing wire to facilitate drawing is widely practiced in the mills. Cuprodizing strips, blanks, cups and shell cases of steel has improved drawing and speeded production.

With proper processing Cuprodized surfaces may be used for decorative purposes.

Cuprodized surfaces may be made more rust resistant if treated with Cuprotek.

Our technicians are available to adapt Rodine or other ACP Products to your individual production problems. Time will be saved if you will give us as complete details as possible concerning your methods and requirements.

Manufacturers of Inhibitors & Metal Working Chemicals

AMERICAN CHEMICAL PAINT CO.
AMBLER ACP **PENNA.**

Note—West Coast Plants may address inquiries and orders for prompt delivery to Leon Finch, Ltd., 728 East 50th St., Los Angeles, California.

AMERICAN CHEMICAL PAINT COMPANY, AMBLER, PA.

Please send me general Technical Service Data Sheets on

Name_____ Title_____ ☐ *Cuprodine*

Company_____ ☐ *Cuprotek*

Address_____ B-3

Hand pressure tank suitable for the spray application of self-emulsifying type cleaners. Oakite Products, Inc.

which rinses readily, carrying off the dirt and grease. This type of cleaning can also be adapted for automatic operations, with either a dip or spray application of the compound-kerosene mixture, and a spray rinse.

For maintenance cleaning, a portable spray tank can be obtained to apply the solvent mixture. A water or water-air high pressure rinse leaves the machine free from oil, grease and dirt, ready for repair or repainting. Due to wartime shortages of chlorinated solvents, some users of vapor degreasers have converted their machines to self-emulsifying dip and rinse operations.

Alkali Cleaning

A great deal of industrial metal cleaning is done with alkaline cleaning solutions. These materials are compounded for the specific type of cleaning required. No one formulation is the perfect answer to all metal cleaning requirements. For example, a cleaner designed for dip operation must have excellent wetting properties, which will enable the solution to reach the metal and loosen the dirt, so that it may be removed in the rinse. The wetting agent added to this type of cleaner will cause excessive foam, if it is used in a power washer. In a power washer, the force of the sprays and the flow of the solution over the work help to remove the soil mechanically.

Alkaline cleaners must be free rinsing. This property is imparted to the material by proper formulation. The cleaner must not react with the metal to cause etching or staining. This is especially important in cleaning aluminum, magnesium or brass.

Adaptable to a Variety of Production Requirements

One reason for the widespread use of alkaline cleaners is their adaptability to the varied requirements found in industry. These include dipping, power spray, and electrolytic cleaning with either anodic or cathodic current. Such an electrolytic cleaning operation will produce the chemically clean surface required for electroplating.

In electroplating, it is frequently found economical to preclean the work with a solvent wash, degreaser, or self-emulsifying type cleaner, before the electrolytic alkaline cleaning operation. This

Cleaning a locomotive by using steam lifting spray gun. Photograph supplied by courtesy of Oakite Products, Inc.

NOW AVAILABLE!

for Permitted Uses

as per WPB Amended Order M-1-g

RESTRICTIONS on the use of aluminum pigment are now relaxed by order of WPB. So PERMITE Ready-Mixed Aluminum Paints are again available for a broad list of product finishing and industrial uses, which carry an order rating of AA-5 or higher.

Aluminum paints may now be supplied on orders of such rating, for use "in the manufacture, maintenance or repair of combat products complete for tactical operations when they are being produced for or used by the U. S. Army, Navy, Maritime Commission or War Shipping Administration . . . " according to one of the seven classifications of permitted uses under the new WPB order.

Among several other permitted classifications are industrial equipment and interior of industrial plants where excessive moisture, fumes, or temperatures prevail.

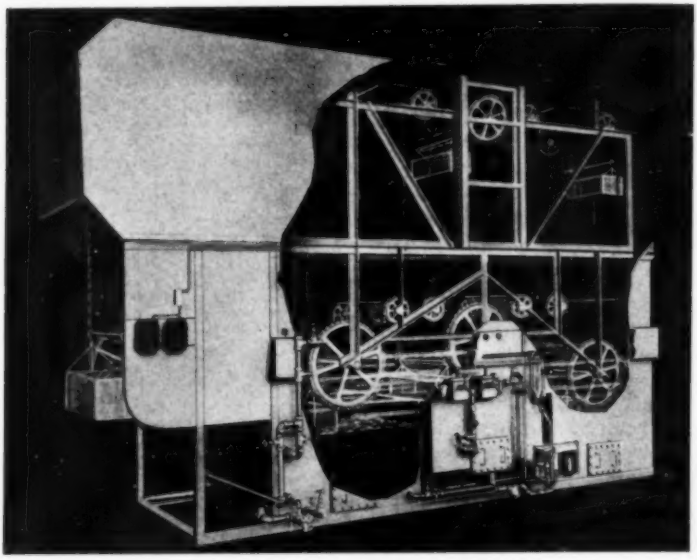
Write Today for copy of WPB Amended Order M-1-g giving **complete list** of permitted classifications for use of aluminum paint.

ALUMINUM INDUSTRIES, Inc., Cincinnati, Ohio

Distributors in Principal Cities

The Permite Line of Industrial Finishes includes Permite Government Specification Paints for War Production use.

PERMITE READY MIXED ALUMINUM PAINTS



Conveyorized degreaser with vapor rinse, hot solvent dip, cold solvent dip, and vapor rinse phases. Photograph supplied by courtesy of Detrex Corp.

method will give a larger volume of production through the cleaning operation than could be obtained by doing all the cleaning in one alkaline electrolytic tank.

Power Washers—Their Operation and Maintenance

Power washers, using alkaline cleaners, are available from many companies. These are usually designed and engineered to clean one or more specific units. The location and number of spray nozzles are determined by the size and shape of the article to be cleaned and the rate of travel of the conveyor. Due to the extensive use of these machines, the following suggestions are offered for the most satisfactory results:

1) Use a cleaning material that has been specifically formulated for use in a power washer.

2) Check the concentration of the cleaner at regular intervals, and make additions as indicated from these tests. Too low concentration will not clean efficiently, and too much is a waste of material.

3) Dump the solutions at regular intervals to prevent redepositing of the dirt on the work.

4) Maintain proper temperature of the solution and rinse water.

5) Check the rinse water to determine whether excessive amounts of alkali are being carried over. A simple test to determine whether or not the rinsing operation is ef-

THESE CANS *CAN* TAKE IT!

Oakite-Prepared Surfaces Assure A Paint Finish Which Defies Jungle and Desert Climate!

DESIGNED by the Army Ordnance Department for holding pure drinking water, these five-gallon cans of sturdy steel construction have what it takes to stand up in hard service. The durable olive-drab paint coat provides dependable protection against atmospheric conditions in all climates.

Performs Two Functions In One Operation!

Of significant importance is the Oakite surface preparation they get before painting. By thoroughly cleaning the surface with a special Oakite material, one manufacturer of these so-called "blitz" cans makes certain not only of removing all oil, grease and other soil, but also of imparting to the steel surface a rust-inhibiting microscopic coating at the SAME TIME! This new Oakite conditioning treatment assures paint adhering with a strong lasting bond . . satisfactorily meeting every service requirement.

Tell Us Your Finishing Problem!

If you have a problem in preparing ferrous metals for painting or similar finishing operations, let us send you a new Service Report which gives further details. Write TODAY for FREE copy!

OAKITE PRODUCTS, INC., 32F Thames St., NEW YORK 6, N. Y.

Technical Service Representatives Located in All Principal Cities of the U. S. and Canada

OAKITE MATERIALS · METHODS · SERVICE

CLEANING FOR EVERY CLEANING REQUIREMENT

fective can be made by placing a piece of red litmus paper moistened with distilled water on the cleaned surface. If the paper turns blue it indicates the presence of alkalis and shows the rinsing operation was not completely carried out.

Alkaline cleaners can be used for cleaning large structures or equipment by use of a steam lifting gun. This consists of a steam siphon which heats and sprays the cleaning solution on the object to be cleaned. After a short soaking time, the work can be rinsed with steam. This system is used to clean trucks, tank cars, locomotives, buses and equipment of similar character.

Removing Mill Scale From Steel Surfaces

None of the cleaning methods described so far in this article will remove the tightly adherent mill scales or oxide films from steel, except the electrolytic cleaners. This scale can be removed mechanically by dry blast cleaning. A high pressure jet of air carries the abrasive grit or crushed steel shot against the work, cutting the scale by an abrasive action. Airless blast equipment can be obtained, in which the abrasive is thrown against the work by rapidly rotating wheels. This can be done at production line speeds.

Pickling with sulfuric or hydrochloric acid is the most common method of removing oxide film. The work is immersed in the acid until the scale is dissolved, and then rinsed to remove the excess acid. Inhibitors are recommended to reduce the attack on the bare metal, without slowing down the pickling action. Electrolytic pickling is used for high speed handling of coiled steel strip.

To insure uniform pickling, all oil and grease should be removed from the metal before introducing the work into the acid. The blast-cleaned or pickled surface is chemically clean and the subsequent finishing operation must be done quickly to prevent oxidation or rusting of the surface.

Burn-Off Methods; Flame-Priming

In some cases, where oil must be removed prior to painting or pickling, it has been found satisfactory to heat the metal with an open flame, or pass it quickly through a furnace, thereby burning off the oil and producing a dry surface. An adaptation of this principle has been developed and is presented to the trade as flame-priming. This operation consists of passing a specially designed oxy-acetylene torch over the surface of the metal. Loose scale is removed, due to the expansion which causes it to flake off, leaving a clean tight oxide coating suitable for immediate painting.

The foregoing brief summary describes commonly used cleaning methods. As noted, these methods may be used in combinations to obtain most economical cleaning, or maximum production speeds. As with most industrial processes, various individuals have preferences for one type of cleaning method over another, both of which will produce similar results. Frequently, previous experience with one type of cleaning method will influence choice of the individual, when additional cleaning problems arise. The author makes no attempt to recommend any specific cleaner or method, but has tried to present a general picture of the methods used in industry.

DESPATCH-ENGINEERED OVENS SET RECORDS IN WAR AND PEACE

Maximum baking output with best use of labor • Improved finish quality • New savings in fuel, floorspace and time.

TODAY, setting new all-time records in wartime finish-baking of shell-cases, are specially designed Despatch ovens which owe their exceptional performance to 44 years of experienced engineering—by Despatch.

Yesterday, this engineering skill helped civilian industry set records, too. Thus in one plant Despatch designed an oven which boosted finish-baking of pencils 293% per unit of labor.

Tomorrow, whatever your problem in finish-baking, Despatch engineers will be *first* to help you. Call on Despatch and save time, effort and expense.

SEND THIS COUPON TODAY

DESPATCH
OVEN COMPANY MINNEAPOLIS

DESPATCH OVEN COMPANY, Dept. IF2
722 Central Avenue, Minneapolis 14, Minnesota

Without obligation, please send me more details about Despatch high-speed finish baking ovens.

☐ Conveyor ☐ Rack-Loading ☐ Cabinet
☐ Gas ☐ Oil ☐ Electric ☐ Steam ☐ Infrared

*Name*_____

*Company*_____ *Title*_____

*City*_____ *State*_____

What I have written here is based on some practical experience and information that I have gathered on diversified finishing and finishing materials, while using them.—

F. R. Boynton

Some Timely Pointers on Metal Finishing

BY F. R. BOYNTON

THE FIRST STEP in metal finishing is to make sure that you have a clean surface. Without a clean surface, it is impossible to get a satisfactory durable finish. The metal should be cleaned thoroughly. When metal parts or products accumulate before the paint shop is ready for them, and if there is excess residue of oil and grime on them, the metal should be precleaned with an alkali solution and rinse. Following this, I recommend an acid spray wash, which I believe is the best of all for producing a really clean surface.

I prefer the acid type cleaner, for this has been used with much success and I have noticed that a chemical action takes place that assists in bonding the paint film to the surface—and, to a certain extent, this treatment combats rust and corrosion. If the cleaning department is equipped with a 3-stage washing machine, the machine can be used to advantage for all three operations (as mentioned above) thereby consuming less time.

Prime Coat; Adhesion and Permeability

The prime or foundation coat cannot receive too much attention for, like a building, the finish is no better than its foundation. In addition to being a foundation for the finish, the prime coat is also a protective coating, combating rust on some metals and corrosion on others; but the first thing that is expected of a primer is adhesion.

There are two types of adhesion —mechanical and molecular. Mechanical adhesion depends upon the ability of the primer to penetrate into the pores of the metal surface. Very smooth surfaces should be sandblasted or lightly etched with an acid solution or other chemicals that are compatible with the coating to be applied.

Pigmentation also influences adhesion, decreasing with the amount of pigment that is added. That is why a transparent coat or primer is usually applied. The nature of the pigment also affects adhesion indirectly by the prevention of corrosion, as red lead on iron, and zinc chromate on aluminum and lighter metals. *(To Page 52)*

FINISHES QUICKLY REMOVED

PAINT · ENAMEL
VARNISH · LACQUER
SYNTHETICS · SHELLAC

Consult us on your Removing Problems

As makers of the largest and most successful line of paint removers, we can give you the benefit of wide experience in solving removing problems. If you will tell us the type of finish you wish to remove, we'll be glad to send you specific recommendations.

LINGERWETT—our general, all 'round remover—is the favorite of painters and the largest selling remover in America. As its name implies, Lingerwett stays *wet* for a sufficient length of time to penetrate the toughest finish and soften it up for easy removing. It is not harmful to metal, wood or any other surface.

SAF-TE Remover has all the qualities of Lingerwett, but is *non-burnable*.

NO-WASH is recommended to those who wish to dispense with the necessity of a wash-up after removing the finish.

You can obtain these removers from leading distributors. Write us in detail for our recommendations on any special removing problem which you may have.

WILSON-IMPERIAL COMPANY

115 CHESTNUT ST., NEWARK 5, N. J.

DEPT. E-34

Molecular adhesion takes place on any smooth surface, such as glass or polished metals, etc., and where no mechanical adhesion can act. Synthetic resins are compounded for this purpose—in such a way that molecules are attracted to their polar ends and adhere in much the same way as by magnetic attraction. Of course, any lack of molecular adhesion may be counteracted by mechanical adhesion, or vice versa, and in many instances both types take place at the same time.

Some Things That Counteract Adhesion

There are several forces that counteract adhesion, but as a rule highly flexible films, such as oil paints, show excellent adhesion because there are no forces that can develop which are strong enough to cause breakage of the film due to contraction and expansion. With synthetic lacquer enamels however, it is another story. Forces may be developed during the first stages of aging or by the metal itself expanding and contracting, due to humidity and temperature change.

I have noticed quite a bit of adhesion trouble with specification lacquer enamels of the lusterless type. Excess pigmentation is used to help produce the dead flat appearance of this type of paint. Naturally, poor adhesion and powdering of the coating were the result, especially if the lacquer was applied on the bare metal without priming.

Permeability is the "breathing" of the paint or other coating film, and governs adhesion directly because it controls the interchange of moisture between metal and the atmosphere. If the film allows too much moisture to get through, the metal will rust and destroy the paint adhesion. It is also true that if the paint film is too dense and is unable to "breathe" properly, vapors will develop underneath and cause the coating to peel off. Also, aqueous solutions of iron salts form between the metal and the paint and will precipitate layers of iron hydroxide, which diffuse into the paint film, thus weakening its resistance.

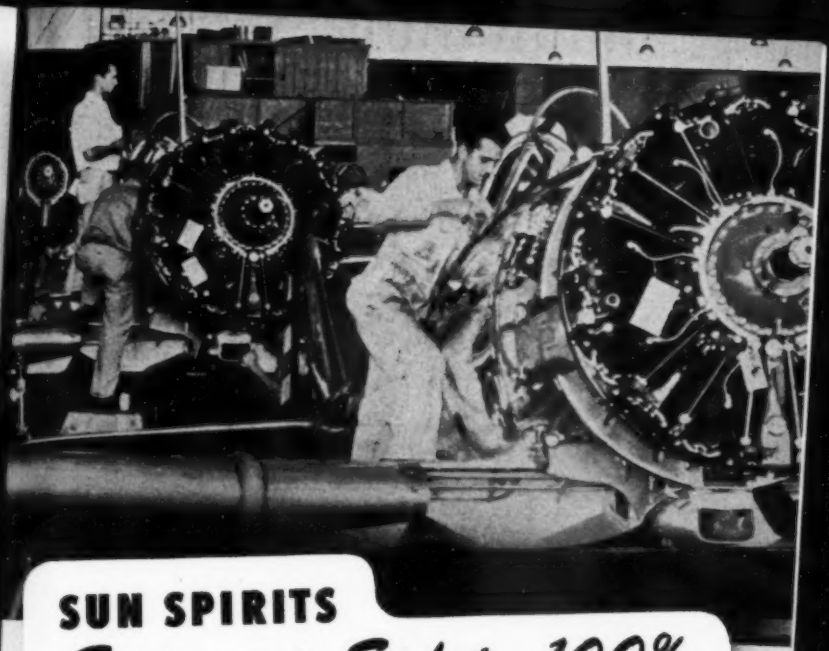
It is essential to have a clean paint shop and spray room for product painting. Spray booths should be so placed as to utilize the conveyor in the most efficient manner. Each booth should have a trash can beside it to receive used wiping rags and other accumulations. The spray room should be enclosed and the incoming air should be filtered.

Technique of Correct Spraying

The best production is obtained with the pressure system, where the paint is piped to the booths. Then different colors or materials may be sprayed without tearing down a set-up or without stopping to change or clean the spray gun. This system promotes cleanliness and reduces fire hazards. It promotes more accurate thinning, more thorough mixing and better performance of the paint.

Spray guns should be cleaned at intervals in order to avoid unbalanced flow and breaking up of the paint. Continuous spraying without cleaning allows the paint to clog the air passages of the breaker head and around fluit tip.

Zinc chromate needs close attention when it is sprayed because it is a poor leveler. If it is not applied properly and skillfully you will have sagging and a coating of uneven thickness. Just barely



SUN SPIRITS

Steps up Safety 100%

steps down cleaning costs at aircraft plant

Under exacting Government "specs," and at top speed, American manufacturers have succeeded in producing the finest war planes in the world. One aircraft manufacturer, working 'round the clock, solved the problem of washing wings, fuselage assemblies and motors.

Previously, the hazard of fire threatened constantly . . . in addition, objectionable fumes were present, which were irritating to many workmen.

When Sun Mineral Spirits was put on the job, safety improvement was 100%! There were no harmful fumes or ill effects on the workmen.

A saving of ⅓ in costs was also effected by the change, as compared with previous chemicals . . . and, in addition, losses up to 15% were saved in evaporation alone!

This is typical of the performance Sun Spirits is giving in war plants throughout the country . . . helping to speed vital material to our fighting fronts. Your plant, too, can profit substantially by cleaning with Sun Spirits. For further information, write for your free copy of "Case Histories of Cleaning Up War Parts."

SUN OIL COMPANY • Philadelphia 3, Pa.

Sponsors of the Sunoco News Voice of the Air — Lowell Thomas

SUNOCO

SUN INDUSTRIAL PRODUCTS HELPING INDUSTRY HELP AMERICA

enough primer should be applied to give the metal casting an even transparent coat, which should have a green tinge. A solid yellow color indicates that too much has been applied, or that the primer has not had sufficient reduction.

Sanding Surfacer; Knifing Putty

Sometimes, when the surface permits or when other conditions demand it, the baking enamel (or air dry enamel) is applied directly over the primer, after a light sanding operation to remove any roughness. However, for first-class smooth work a sanding surfacer should be applied. Being opaque the surfacer provides the proper background for the enamel (which is semi-transparent). Before sanding the surfacer, the work is inspected for holes or other rough places that will not be smooth after the final finish coat is applied.

Any holes or depressions that are found can be built up with a suitable putty made for this purpose. In an emergency the finisher can prepare a putty by mixing one part of dry plaster of Paris with two parts of dry water-floated silica and stirring this mixed powder into enough lacquer sealer or other quick-drying vehicle to bring the material to a knifing consistency — or to whatever consistency that is desired. This putty dries hard, sands easily, will not shrink, and any type of coating may be applied over it.

When spraying synthetic enamels, do not try to get a heavy coat on in one time over; you will have a much neater job by screwing the needle of the spray gun in, and going over it twice. This lessens the chance of sagging and unevenness. It is not so much the number of pieces that are sprayed per day but rather the ones that pass inspection that count.

When Your Enamel Doesn't Dry Properly

Sometimes the foreman gets a batch of enamel that does not dry properly. If the paint comes from out of town, the foreman probably will add some drier that he may have in stock — and, rather than call for a service man, he will add what he thinks is sufficient. This is all right where the foreman is acquainted, in some respect, with drier chemistry. It is well to remember that air-dry enamels dry by oxidation, while baking enamels dry by polymerization. It is true that metals which accelerate drying by oxidation also favor film formation by polymerization, but the efficiency in the two types will vary.

Cobalt is an excellent oxidation drier, but it is a weak sister when accelerating polymerization. Lead is just the opposite. Iron is a good drier at very high temperatures but has practically no value at low temperature. Soluable solutions of the metals tin and titanium have no effect on oxidation, but they accelerate polymerization considerably. There are several more angles to drier problems than are ordinarily realized. It should be remembered when adding driers to baking enamels, just a trace is all that is generally needed. In a synthetic-resin vehicle, the common practice is to add .001% cobalt and .002% of lead.

Wrinkle Finish and How to Use It

When spraying a wrinkle finish (where a convection-type oven is available) it is wise to spray a

(Continued on Page 59)

SAVE FINISHING TIME

WITH LACQUER

NITROCELLULOSE LACQUER is the most satisfactory general purpose finish for industrial use. It is easy to apply . . . dries quickly . . . and forms a tough, durable coating which retains its good appearance through years of service. When repairs are necessary, a lacquer finish is easy to patch and easy to match. For speed, convenience, and economy, finish with lacquer.

NITROCELLULOSE LACQUER—the post-war finish on today's war products.

CSC makes no lacquers or thinners but supplies solvents and plasticizers to manufacturers of protective coatings.

CSC

COMMERCIAL SOLVENTS *Corporation*

17 East 42nd Street, New York 17, N. Y.

CASE OF TH

How a Du Pont War Service Man Gave it a Hot Bath and Cured "Seeding"

HERE'S THE STORY: This manufacturer of metal equipment had finishing trouble. No matter what he tried, tiny particles—looking like grit—showed up to mar the final finish. After his every attempt to solve the problem he asked for help.

ENTER THE DU PONT MAN: One by one he considered possible culprits. The first suspect, the finish itself, was quickly cleared of blame. A laboratory check of a retained factory sample had indicated that the fault was not there. All appeared in order until the Du Pont man came to the finishing room. He found that the thinner was stored in an adjacent, unheated building. Here he broke the case within a few minutes.

THE SOLUTION WAS SIMPLE: Lack of heat in the outbuilding was to blame. Thinner stored here was pumped to the mixing-room and used for reducing the

WRITE OR WIRE THE DU PONT WAR SERVICE MEN

☐ *How to speed output and save materials*

Handy pocket-size, fully illustrated booklet, *"Hints on Wartime Finishing Economies."* Shows you 11 points to check for greater efficiency and speed on your war contract finishing schedules.

☐ *How to meet emerge and solve problems*

Check here for the help of Du War Service Men—skilled "tro shooters" to straighten out "ki in your finishing system *befo after* the trouble occurs. T "know how" is at your dispos any war contract finishing. about your trouble. Or wi case of emergency.

SHIVERING THINNER

enamel. Cold thinner added to enamel at room temperature brought on precipitation and "seeding."

It was inconvenient to heat the outbuilding or to change the source of storage. But the Du Pont Man immersed the feeding pipeline, in a tank of warm water. The thinner rose to the correct temperature for blending. "Seeding" stopped. Finishing went ahead on schedule.

When a Du Pont Man is called in like this, he brings to bear on the problem all of his Du Pont training and long years of experience in the analysis of finishing problems.

There's a Du Pont Man near you who will be glad to consult with you on finishing problems. Write to:

E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Wilmington 98, Del.

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
...THROUGH CHEMISTRY

MAIL THIS COUPON! E. I. DU PONT DE NEMOURS & CO. (INC.)
FINISHES DIVISION, WILMINGTON, DELAWARE

SEND THIS ENTIRE COUPON TO:
E. I. du Pont de Nemours & Co. (Inc.)
7150-C, Du Pont Building
Wilmington 98, Delaware

NAME_____

FIRM_____

ADDRESS_____

(This coupon good only in the U.S.A.)

Eliminating "GUESS WORK"

Now, more than ever before, is there need for careful consideration of types and qualities of finishes for postwar application. Walker Laboratories have been working on these items for some time, and offer a wide variety of coatings from which all "guess work" has been eliminated.

Here Will Be Your Dependable Source of Supply for All Types of Industrial Finishes

PRIMERS—SURFACERS—LACQUERS
SYNTHETICS—WRINKLES

TO MEET YOUR POSTWAR PRODUCTION FINISHING REQUIREMENTS

"Call on Walker"

H. V. WALKER CO.
Elizabeth, New Jersey
MODERN PRODUCTION FINISHES

few pieces and put them in the oven until they have had time to develop, which will be about 10 or 15 minutes. Then the operator may take them out and inspect them and note his mistakes, if any. It is well to check the exit end of the oven line at intervals in order to ascertain the performance of the wrinkle finish.

Most alkyd and phenolic modified alkyd enamels will bake out in 45 minutes to an hour at 275° to 300° F., in the convection-type oven. With the manufacturer's recommendation however, the temperature may be raised and the enamel may be baked out in shorter time. If you are using the convection-type oven, and if it is fairly old, the thermostat should be checked for accuracy occasionally in order to avoid under-baking or over-curing.

Sometimes, when you are spraying light-colored enamels and using a convection-type oven on which the thermometer is slow, chances are that the excess heat will discolor the enamel, resulting in a job for the stripping tank. The oven should also be checked for ventilation.

Recently I was in a paint shop where they were having trouble with their gloss enamels wrinkling and corrugating. They thought that some mistake had been made in the shipment of material. A careful check-up revealed the fact that it was only a case of improper ventilation, with foul air in the oven.

Mixing Equipment Awarded Army-Navy E

The plant of the Mixing Equipment Co. in Rochester, N. Y., was the scene of special ceremonies attending the award of the Army-Navy "E" on Feb. 5.

Recommendation of Mixing Equipment Co. for this award was made by the War Production Board and presentation of the Army-Navy "E" Pennant was made by Col. Frank J. Atwood, Chief of Rochester Ordnance District, War Department, who in his remarks paid tribute to the achievement of Mixing Equipment Co. in its production of fluid mixing equipment. He pointed out to the employees and their families, who were present at the ceremonies, the important part Mixing Equipment Co.'s products played in the heat treatment of armor plate, and the way they were helping to increase output of aviation gasoline.

Presentation of the Army-Navy "E" pins to Mixing Equipment Co. employees was made by Lt. Comdr. Douglas H. Elliott, USNR., Field Officer, Industry Cooperation Division Office of Procurement and Material, Navy Dept. Acceptance was made by Fred H. Gordon, Jr., President of Mixing Equipment Co., who expressed appreciation for the cooperation received by members of the services and assistance of suppliers and pledged on behalf of employees and management a continuance of the same high production record.

Geo. K. Graves of Detroit Joins Jones-Dabney Co.

Geo. K. Graves has been appointed Director of Automotive Sales for Jones-Dabney Co., with headquarters in Detroit. Mr. Graves is a graduate of Penn State with a degree in Chemistry. After one year of research work, he became Technical Advisor on lubricating oils for Standard Oil of Indiana. For the past 16 years, he has been in the sales department of a well known manufacturer of automotive finishes in Detroit.

Ferbert-Schorndorfer Adds Three Salesmen

The Ferbert - Schorndorfer Co., Cleveland 11, Ohio, announces three additions to its sales staff as follows:

Roland P. Weyand, who joined the sales force Jan. 1, will be located in Detroit at the company's office, 5-270 General Motors Bldg. Mr. Weyand has been actively associated in the industrial finishing field for the past 18 years.

Mr. Rex B. Wilson, who joined the sales force Feb. 1, will be located in Chicago, as the company's representative.

Mr. S. N. McKinney, who also joined the sales force on Feb. 1, will be located in Pittsburgh territory.

Here are a few thoughts that are in line with your request. We have been so busy at Zapon that there has been little time for writing articles. We do find time to read INDUSTRIAL FINISHING.

R. J. Fairburn

Postwar Indications

Some changes that are being planned in product finishing; what they mean to you, your organization, your customers and your future competition.

BY R. J. FAIRBURN
Zapon Div., Atlas Powder Co.

FROM our observation, many users of industrial finishes are now more quality conscious than they were before the war. Perhaps exacting Government specifications have had a beneficial influence.

The prewar finish of one appliance was one coat of a moderate priced enamel. Although this is made of zinc die-castings, no particular surface preparation —other than a cursory cleaning— was provided.

For post-war finishing, this concern will provide a better bond to this difficult surface, and retard corrosion by using a phosphate treatment. Their enamel will be the best synthetic resin formula that can be made. This enamel is formulated to withstand the acids and moisture that this item encounters in use.

A manufacturer of plated ware has protected his plate with one coat of a nitrocellulose lacquer. He has always considered this to be an adequate finish. He would never take time to try anything else. For his postwar finish, he will use a baked clear synthetic coating. With it he can give a life-time guarantee to his products.

This concern uses a low-melting solder. Lacquer does not affect their solder joints. They always supposed that a baked finish would. Now that they have had time for investigation, they learn that a finish is available that will cure at 250° F. After they install an oven, the baked finish will cost no more than the one coat of lacquer. Increased mileage of the synthetic will offset baking cost.

Old Routine Disrupted; New Ideas Have Come In

This is typical of many manufacturers. In pre-war days they were too timid, too busy or too complaisant to disturb their usual way of doing things. Now that the war has disrupted their old routine, they are finding time to consider improved methods and materials.

Some concerns have installed new spray equipment, new ovens and new conveyors for war contracts. This improved equipment will improve their postwar finishing. Incidentally, some of this

SEA-LAC FACTS

Featuring SEA-LAC Finishes and Their Application

SEA-LAC

Finishes to Government Specifications and "Sea-Lac" Recommendations

A FEW OF "SEA-LAC'S" PROTECTIVE COATINGS IN PAST AND PRESENT SERVICE

ZINC CHROMATE AND OTHER PRIMERS
For Aluminum Alloys, Steel, Cadmium and Other Metals

METAL AND PLASTIC FINISHES
High Soap and Heat Resistance
Salt Spray and Solvent Resistance
Low Moisture Permeability
Coatings for Protection Under Continuous or High Water Pressure

AIRCRAFT DOPES

WRINKLES—NO CRITICAL OILS

STRIP COATINGS FOR MASKING OPERATIONS
(Solvent or Waterproof)

WATER DIP LACQUERS

ADHESIVES, QUICK-DRYING
Fabric to Fabric
Cellophane to Fabric
Onion Skin to Metal
Rubber Cement Substitute, Requiring No Curing
Acetate Cement
Hard Rubber to Wood and Plastic

CEMENTS, HEAT SEALING
Paper to Metal
Paper to Paper
Metal to Cloth

COATINGS FOR FABRICS
Waterproof, Gasproof and Flameproof Coatings for
Cotton, Rayon
Silk and Straw

We could go on and on, as the list is practically inexhaustible. Some are serving at the front now. Some have served industry before. All will serve the nation in time to come.

There is an answer to every finishing problem. We either have it, or will formulate it for you without incurring obligation on your part. If it is a finishing problem whether metal, wood, fabric, or any other surface, chances are good that Duralac Chemical Corporation has an answer for it. Submit your problems for our recommendations.

DURALAC CHEMICAL CORPORATION

LISTER AVENUE, NEWARK 5, N. J.

equipment has been purchased by concerns who will not need it for their civilian lines. It will be available for alert bargain hunters who can find good use for it. Many present manufacturers of cartridges and shells will have such equipment to sell after the war.

Demand for Information More Insistent Than Ever

There is a new hunger for information. Foremen and finishers are asking us for literature that will enable them to learn more about the materials which they have been applying. These names are being added to the mailing lists of INDUSTRIAL FINISHING magazine.

Many young men are being technically trained by the United States government. Perhaps some of the men now in industry realize that these youngsters will give them some stiff competition when the war ends. They want some technical training to supplement their practical knowledge.

Far sighted managers, too, are encouraging key personnel to train for better postwar jobs. Many likely men are being sent to school by their employers. Even salesmen—and I mean barnacle-covered old veterans—are encouraged to train for the stiff competition that lies ahead for all of us. Lordy, what a knowing race we are going to be.

This thirst for knowledge, this hunger for technical skill, this time for thinking and planning add up to one thing: There will be an urgent demand for new things to try when the war contracts are out of the way.

Paint laboratories are understaffed and overworked now. Substitutes must be found for hard-to-get materials so that wheels will continue to turn. There is no time now to tailor make finishes for particular, civilian conditions.

If I were a user of finishes, however, I would lose no time in placing my postwar problems in the competent hands of my paint supplier. It would be near the top of the list then. It would get attention ahead of the rush that is coming.

The time may be very near when a great many civilian items will again go into production. We expect more requests for technical service then than the available technical men can handle. The war did not disrupt basic research. It accelerated it. Much of the war development work will be reflected in postwar formulations. These basic developments must be fitted to individual requirements. This is where the heat will be.

Will Direct P.P.G. Sales of Transportation Finishes

William T. Carey has been appointed to the newly created position of director of sales on transportation finishes for Pittsburgh Plate Glass Co., with headquarters in Pittsburgh.

W. T. Carey has had long experience in the selling of transportation finishes for P.P.G.

Between 1923 and 1935, Mr. Carey was the Company's railway paint sales representative in the St. Louis territory and more recently held the same position in the Chicago territory.

Put this Gun into the hands OF YOUR FINISHING MEN

To Speed Production—The Paasche Type CUB High-Production Airbrush provides the fastest method for spraying all types of finishing materials. Its light weight (only 22 ozs.), perfect balance and "hand molded" grip enable men or women operators to work longer hours at full production.

To Improve Quality—Its perfect atomization assures finer finishing at top speed. Micrometer calibrated spray pattern control provides precise, easy adjustment for any job.

To Slash Replacement Costs and Headaches—The sturdy construction—with all working parts enclosed in strong, machined brass body—protects against damage and assures longer life. Floating air valve takes up wear, prevents leaks. The CUB stays on the job!

These special advantages of the Paasche High Production Airbrush are typical of the superior quality features to be found in the entire Paasche line. Get the facts and you'll get Paasche Airpainting Equipment.

Write today for detailed information. Paasche Airbrush Co., 1917 Diversey Parkway, Chicago 14, Ill. Paasche Airbrush (Canada) Ltd., 110 Elm St., Toronto.

Paasche AIRPAINTING EQUIPMENT

pressure regulators, airconditioners for compressed air lines, air dusters and stripers.

Force Drying System Doubles Production

BY F. L. ELLIOTT
Chief Engineer
Koch Industrial Equipment

UNINTERRUPTED production of 100 chairs per hour! That's what one of the south's largest chair manufacturers wanted, and that's what a finishing room system, designed and installed especially to fit the job, is giving them.

Chairs are now taken directly from the millroom, put through five finishing operations; three sanding operations, with the necessary drying and cooling periods between each finishing coat; and turned out ready to be packed and shipped within eight hours.

The cost of this installation was surprisingly low. It would open the eyes of those who are using thousands of square feet of floor space and losing hundreds of hours of handling time, allowed for the usual air-drying after each coat. The entire system, which produces a steady rate of 100 chairs per hour ready for crating, occupies approximaely 10,000-sq.ft. of floor space.

How did the drying-system engineers accomplish all this?

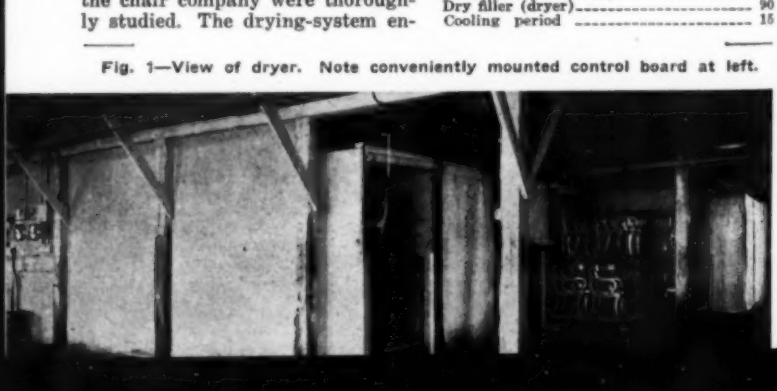
First, the job requirements of the chair company were thoroughly studied. The drying-system engineers then furnished a complete set of drawings to the chair manufacturer, showing exactly how the system was to be installed. Recommendations included a system of dryers with humidifying units necessary to maintain the proper heat and humidity ratio, and a dryer housing, which was conveniently furnished by the chair manufacturer.

The housing is a simple construction of 2x4-in. studs lined with ¾-in. asphalt impregnated Celotex. The outside of the dryer walls is covered with plywood, providing an air space between the studs which adds additional insulating qualities.

Here is a breakdown of the process. (Times given include movement between operations):

Water Stain (dip)	(minutes)	7
Air Dry-Water stain		30
Sand		7
Filler (brush and rub)		7
Dry filler (dryer)		90
Cooling period		15

Fig. 1—View of dryer. Note conveniently mounted control board at left.



Since 1875

O'BRIEN

INDUSTRIAL FINISHES

Not the Most · · Just the Best

Research and Discovery

IN THE era immediately preceding the first world war, industrial operations began to feel the influence of the technician's laboratory. Industry had discovered the chemist.

It was in that era that the research program of the O'Brien Varnish Company became organized on a sound technical basis. Previously, manufacture had been controlled by the common practices of the day. Inspection of incoming raw materials, for instance, had seldom been rigid. Chemical control during processing had received only cursory attention. Positive uniformity of products from batch to batch had not been mandatory.

As the technician and exact science entered the field, standardization became a part of O'Brien's life blood. One of the outstanding achievements of the new program was O'Brien's Liquid-Lite Enamel. A search of all available literature on white enamels did not disclose a single fact on their fundamental control. O'Brien development had to start from scratch—beginning with pure research to determine what produced "flowing" as well as its opposite cousin, "brush marks"; what contributed to easy working in conjunction with controlled flowing; what determined non-yellowing qualities; what means of control could be devised when it was shown that old-fashioned proportionate blending methods did not do the trick. Nothing was taken for granted. Throughout the whole undertaking, biased hopes and ambitions were subordinated to positive, reproducible facts.

The result was a non-yellowing white enamel which, without sagging, flowed enough to reduce brush marks—a product which worked easily under the brush—a product with abnormal coverage per gallon, which the chemist called "hiding power" and lastly a product in which original whiteness was decidedly more permanent in brilliance of lustre.

Hundreds of thousands of gallons of O'Brien's Liquid-Lite have beautified American homes, with repeat performances insistingly commended and commanded, all to the satisfaction of the final judge, the American public.

The effort was intensive, pioneering, interesting in its original thinking and culminated in a most satisfying accomplishment, which, after all, is the only aristocracy recognized in America—the Aristocracy of Accomplishment.

O'BRIEN VARNISH CO.
South Bend 21, Indiana

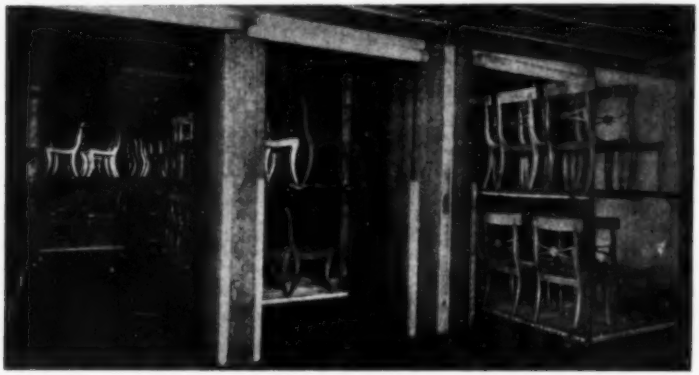


Fig. 2—A peek into part of the dryer reveals some very interesting details. Chairs are placed on double-deck trucks which have strong frame work. Here the arrangement permits a row of loaded trucks to be pushed forward by an entering truck. The truck wheels fit into a channel track in the floor.

Sand	7
Shading stain (spray)	7
Sealer (spray)	7
Dry sealer (dryer)	100
Cool	15
Sand	7
Final varnish spray	7
Dry final varnish (dryer)	120
Cool	15
Total time, 7-hrs., 21-minutes	441

The accompanying illustration marked Fig. 1 gives an over-all view of the compact installation. The operator can readily ascertain the temperature and humidity inside the dryer at any time by consulting the conveniently mounted control board (at left in illustration). Notice the motor mounted near the control board. It operates a suction fan which draws a continuous sample of dryer air across the control bulb at a velocity of 900-ft. per minute. This is necessary to obtain accurate wet bulb readings.

The illustration marked Fig. 2 shows the ducts through which the heated air goes to the dryer. This air comes from a remotely located overhead unit which is heated by waste steam from the plant's own heating system. Notice how the chairs are carried on roller-bearing caster trucks, which were also designed and supplied by the dryer manufacturer for the installation. Note the heavy canvas curtains. They not only prevent the escape of heated and humidified air, but also keep out dust and grit which are naturally harmful to fine finishes.

Production in this chair factory goes on daily at a steady rate, regardless of atmospheric conditions outside. Rejects are fewer, since the finished pieces are no longer exposed to the dust and grit of an ordinary drying room. The usual damage caused by chairs being bumped against each other is also eliminated.

The success of this installation is a testimonial to the merits and possibilities of forced drying—and to the dryer manufacturer's thorough understanding of the forced drying of wood finishes.

The Seven Famous Brands of
BURNING - IN - STIX

A Burning-in-Stix for every purpose, manufactured in 164 standard colors, plus 100 special formulae to meet the needs of manufacturers and others requiring special shades and colors. Any sample panel matched. These stix are made of finest materials and color-stains available. Color-stains are perfectly blended into pure gums, leaving no air bubbles or color specks. Size of stix larger than most. Do not hesitate to try these stix and take advantage of our matching service.

Years of research and thousands of dollars have been invested in bringing these seven famous brands of Burning-In-Stix to their present stage of perfection. The brands include:

Approx. size Porcelstix, 3½ x ⅜ x ⅜; balance of brands 7½x⅜x⅜ packed 12 all one color, or assorted to package; or, Kit Box assortments of all brands except Porcelstix, packed 144 colors of 2½ length.

Special **Lacstix** is made of the finest materials, and will not lift or shrink in or under lacquer. Is free of color specks. Made of special resins that withstand the fast solvenizing action of high powered solvents used in modern synthetic and lacquer finishes. Helps finisher repair surface in one operation.

Special **Shelstix** is made from the choicest shellac gums and resins, and will be found far superior to many brands of shellac sticks. If you haven't tried this Finishine SHELSTIX, you will be wise to put in an order right away, to make certain that your repair work will be of the highest grade.

Special **Porcelstix** is the item you can depend upon to repair chipped porcelain, marble or tile. Does it within ten minutes. Easy to use and comes in assortment of fourteen permanent colors. Porcelstix is made from a unique combination of special resins that puts it in the high quality class. Is waterproof and will stand tremendous amount of heat.

Special **Synstix** is made of special resins that will withstand the fast solvenizing action of high powered solvents used in modern synthetic finishes. Will not lift or shrink under synthetics. A big stride in the stix field.

Special **Varstix** is made especially for varnish finishes. Will not lift or shrink under varnish. Made of exceptionally fine materials so as to coordinate with the latest types of varnishes requiring strong reducers. Will perform a high grade repair job on high grade finishes.

Special **Enamelstix** is a boon to the finisher for repairs on enamel finished wood furniture. May be used in and under any type of enamels on wood. Will not lift or shrink under this type finish. Made of finest materials available. If you handle enameled wood furniture you can not afford to be without this item.

Special **Cementstix** is made of more pure gum and colors than the average wood cement. Many customers using CEMENTSTIX with entire satisfaction. Your finishing repair stock is not complete without this item.

Send for a FREE TESTING SAMPLE of any of the above seven famous brands and convince yourself of its proven superiority.

FINISHINE LABORATORIES, INC., Syracuse, N. Y.

Our Slogan: "Thousands for Research—Without One Cent of Regret"

I know from experience that most designers have vague ideas relative to finishing and the problems involved. We have proved that a process man, working with the designers, is a material aid in seeking out and avoiding certain mistakes. Some time ago I prepared a technical publication for our designers, outlining the information and warnings I have tried to set forth in this article. I hope the information will serve others as well.—

G. C. Close

Design for Finishing

SPECIFICALLY, the purpose of this article is to extend a plea for closer cooperation between design engineers and finish engineers in the production of aircraft parts. It is quite safe to estimate that each year several millions of dollars are wasted because parts are so designed that adequate finishing is impossible.

There is more to correct design than mechanical perfection and the ability to withstand certain precalculated stress loads. Any part, no matter how mechanically perfect, will maintain such perfection only as long as the material from which it is fabricated maintains its original physical and chemical characteristics.

Major Function of Protective Coatings

The major function of protective coatings in and on service aircraft is to protect the materials of construction from physical and chemical deterioration. It is but corollary, then, that when an engineer designs a part that cannot be adequately coated, he is defeating the major purpose of his work.

Many people regard finishing or painting as a process whereby the appearance of an object is altered and made to become more pleasing to the eye. This conception has no place in the manufacture of service aircraft. What attention is given to appearance is tied in with the science of camouflage, and has as its purpose the rendering of the airplane as inconspicuous as possible at all times and under all conditions.

Keeps Out or Retards Invasion of Many Enemies

On the other hand, the protection of the materials of construction from deterioration is vitally important. A finish engineer has many deteriorating agencies with which to cope. Among the most important are corrosion, decay, fungi attack, and galvanic action. Any one of these agencies, left uncontrolled, can soon render a part worthless or unsafe for further use.

The science of aircraft finishing or painting deals with the erection of a barrier between such deteriorating agencies and the basis ma-

The Gem
of
Lacquer Finishes

America's finest

Padding lacquer

QUALASOLE

Gives fine furniture——that needed extra protection. Free book—

"The Finish of Your Lacquer Problem"

QUALATONE PRODUCTS, INC.
21 GAY STREET NEW YORK 14, N. Y.

terial of the part of which it is applied. It must be recognized, however, that finishing processes have certain limitations. When, due to complexity of design, a part exceeds these limitations to the extent that application of an adequate protective coating is impossible, the material of the part is left open to attack by one or all of the deteriorating elements mentioned.

Product Designers, Consult Your Finish Technicians

It is common practice, in most large engineering departments, to consult an experienced welding engineer before designing a part that requires excessive welding. The advice of a capable finish technician or finish engineer would be just as valuable regarding finishing problems, and should be utilized to the same extent.

An endeavor will be made in this article to point out basic requirements of finishing which, if jointly discussed by the finish engineer and designer prior to design, may aid in producing a part that can be adequately protected from the various deteriorating mediums it will contact during active service life. Also, a bit of thought beforehand will often suggest minor changes in design that will make the part adaptable to the more rapid finishing methods.

Corrosion Characteristics of Different Metals

Each material, or alloy of the same material, exhibits different corrosion characteristics. When a designer is contemplating a part, he should determine beforehand just what corrosive mediums it will have to contact during service. Then, with a list of possible materials at hand, he will do well to choose the material that offers the highest degree of resistance to such corrosive mediums.

Another factor important in corrosion control is the elimination, where possible, of dissimilar metal faying surfaces. It is a well known phenomenon that dissimilar metals in contact cause galvanic action. This action is most severe when metals widely separated in the electro-chemical series are involved. Aluminum rates high in the electro-chemical series; and, because it usually constitutes one of two metals in contact in aircraft construction and is generally in contact with a metal of much lesser potential, it is vitally necessary that such faying surfaces be well insulated. Provision should be made for insulating such faying surfaces at a time when further processing of the part will not injure the insulating material employed.

Consider Moisture and Its Possible Harmful Effects

Moisture is a highly corrosive medium, and the most common harmful element with which the airplane will come into contact. Ordinary moisture is bad enough; a saline atmosphere, charged with the chlorides from sea water, is an extremely corrosive agency when in contact with the light metals commonly used in aircraft construction. Moisture not only corrodes metal but will hasten the decay of wood, soften and swell leather, attack rubber, and deteriorate fabrics at a rapid degree.

There are many ways in which proper design can aid in elimination of danger from moisture. General contours for free drainage and ample provision for ventilation of enclosed parts are two methods commonly employed. Accumulations of water are especially harmful to aircraft finishes, and

available

You've waited a long time for this Announcement!

NOW!*

SYNCHROME ALUMINUM PAINT

You've waited patiently for CRES-LITE Ready Mixed SYNCHROME ALUMINUM PAINT. *Now* it is again available for an extensive list of uses, on orders carrying AA-5 or higher preference rating.

Write at once
for complete details of WPB permitted uses.

*For any of the uses permitted by WPB on AA-5 rating.

CRESCENT BRONZE POWDER CO.
120 W. ILLINOIS STREET • CHICAGO 10, ILLINOIS

once the finish has been softened, peeled, or corroded away, the moisture attacks the basis metal itself. Any necessary surface contour, pocket, or enclosure that would tend to trap water and hold it when the airplane is in a normal position should be provided with drain holes so that accumulations of water can not occur.

So far only generalities have been discussed. In the design of service aircraft, all of the conditions just enumerated will be forced on the attention of the designer, as controls for each are included in the finish specification which is a part of every Government airplane contract. This fact alone is an indication of the importance and stress laid upon proper finishing technique by men who have to fly and maintain aircraft in every part of the world.

Major Factors for the Designer to Consider

More specific are the problems that crop up during design, and that are not covered by any specification requirement. Such problems may be relegated to three general categories:

A) Limitations of available finishing facilities.

B) Speed of production required.

C) Problems that exceed certain limitations of finishing practice.

Every finish technician or finish engineer responsible for finishing any product should make available to the design engineers exact information relative to the sizes, types, and production capacities of all finishing equipment available. This is particularly important at a time like the present when new or additional finishing equipment is nearly impossible to obtain. A well coordinated design department can use such information in balancing its demands for certain types of finishing with the equipment available. It will also eliminate the possibility of specifying a finish or protective treatment that cannot be applied due to physical limitations of equipment.

When more airplanes means saving lives, as is the case in the present war, all ingenuity must be utilized to speed up production. When, either due to his own ingenuity or by following the advice of a finish engineer, the designer can adapt the part to one of the more rapid methods of finishing, he has contributed materially to this cause. Often a slight change in design, such as relocation of a lightening hole or an immaterial change in contour, will adapt the part to automatic dip finishing when otherwise it would have to be sprayed, or even touched up by hand.

The third category just mentioned, namely, "problems that exceed certain limitations of finishing practice," is a most costly and serious error. Thanks to the ingenuity of modern finish engineers and the many finishing materials available, such extreme cases seldom occur. But occasionally it happens—and when it does, many man-hours and much vital material may be lost. This problem warrants a specific instance to illustrate its importance.

Example of Designer's Error; Didn't Consider Coating Problem

A certain manufacturer spent thousands of dollars in the design, development and fabrication of an successful — except consultation with an experienced finish engineer. Many tanks were fabricated airplane gasoline tank. Nothing was overlooked to make the tank before the first one reached the

FINISH PROBLEM? Let Egyptian take it off your mind

During three wars and long periods of peace, Egyptian Finishes always have been something special, something finer, from the *protection* and *appearance* standpoint, and from the standpoint of application.

Today...if war production, post war production—or both—pose any kind of a finish problem...put it up to Egyptian.

★ ★ ★

Special correspondence on finishing problems is invited.

THE EGYPTIAN
LACQUER MANUFACTURING
COMPANY
ROCKEFELLER CENTER, NEW YORK 20, N.Y.

Egyptian's new U. S. Government "Spec" Book—4th Edition—is ready. It's helpful and it's FREE. Send for your copy. Please address Dept. A-3.

EGYPTIAN FINISHES

EGYPTIAN
SUPERIOR FINISHES

What is said here in regard to aircraft designers considering the finish problems — such as production facilities, methods and materials — applies also to designers of other products that are protectively coated.

finishing department. And then the ugly trouble reared its head!

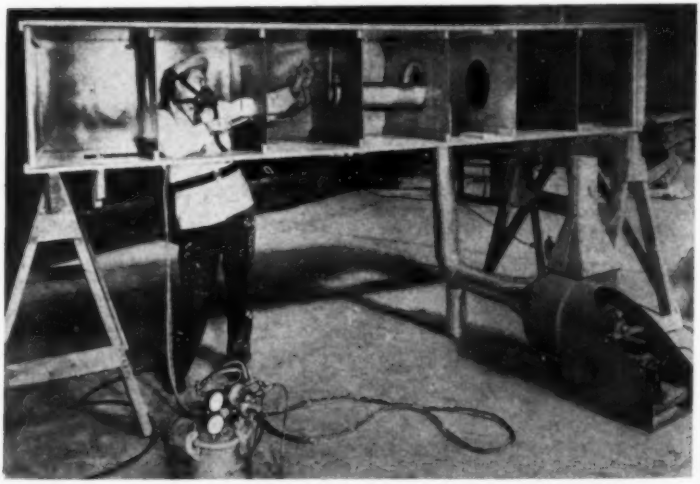
The tanks had been designed with an access opening so small that, after slushing, it was impossible to inspect the job. Filling the tank with slushing compound to assure interior coverage might have solved this part of the problem, but it was discovered that the under-sized access opening did not permit enough ventilation to dry the slushing compound once it had been applied. The process of filling the tanks for coverage and then drying the coating with dehydrated compressed air was altogether too slow and costly. The tanks had to be reworked at additional cost and waste of time.

Basically, there are two processes that any part requiring organic finishing must undergo:

1) Surface preparation.

2) Application of the finishing materials.

Surface treatment may be either simple cleaning, etching to improve the bonding surface, or actual application of a basis protective treatment such as anodizing, chromic or phosphoric acid dip, passivating, etc. The finish engi-



Spraying slushing compound on the interior surfaces of a huge integral airplane fuel tank. (One side is removed here to show you what the spray painter is up against, in trying to spray the interior compartments of a closed tank). Proper forethought and design would have made it possible to apply the coating easily and quickly before this tank became an inaccessible closed structure.

America's war paint is more than just the paints to preserve the weapons and instruments of war. The plants and machinery that build those weapons need protection, too. And maintenance paints have long been a vital segment of the researches of Arco's Laboratories, home of paints for every industrial purpose.

Paints for Industry THE ARCO CO.
CLEVELAND, OHIO • LOS ANGELES, CALIF.

Achieve
THE ELEGANCE OF MARBLE
WITH... MEYERCORD
Sans-Marb
LACQUER VENEER

SEND FOR FULL COLOR BROCHURE OF WOOD GRAINS AND MARBLE RECREATIONS.

The Meyercord Company

CHICAGO 44, ILLINOIS

neer should make certain that the design department is furnished with information relative to each of these processes, when they are best utilized, and limitations to be recognized in expediting application.

The most prevalent problem encountered in surface preparation is handling parts composed of more than one metal. It must be kept constantly in mind that a processing solution that will improve the corrosion resistance of one metal, will often react violently with another. Aluminum parts that require anodizing when designed with steel inserts and bearings, are of common occurance. During anodizing, the exposed steel surfaces must be masked to prevent injury by the anodizing solution. This requires a great deal of time and adds substantially to the cost of the product. The same is true of other solutions where more than one metal is involved. In the case at point, designers are often helpless to improve conditions, but cooperation between design, planning, and the finishing departments may often result in a factory routing of the part so that surface treatment can be accomplished before the dissimilar metals are joined.

Application of Paint Coating Dip; Roller Coat; Spray; Brush

There are four general methods employed for the application of the finishing materials:

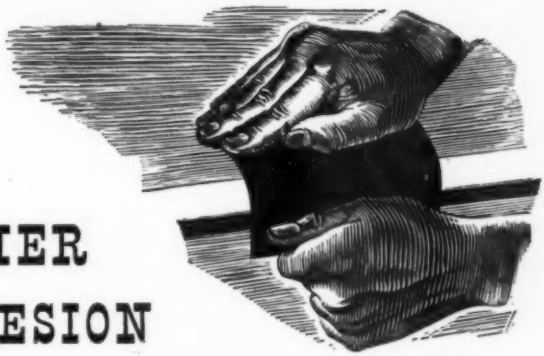
1) Dip coating.
2) Roller coating.
3) Spray application.
4) Hand brushing.

When small parts are involved, automatic dipping is generally the fastest and most economical method of applying either a prime coat or finish coat. The limitations of this process are based directly on the shape of the part. A part to be dipped must have a surface contour in at least one direction that permits free drainage of excess finishing material after dipping. Pockets, holes, or surface depressions facing in opposite directions eliminate the possibility of dip finishing. No matter which way such parts are suspended during the dipping operation, the surface irregularities mentioned will act as cups and prevent drainage.

Roller coating is an extremely rapid method of applying finishing material to flat sheet stock. In aircraft work, this process is usually employed for priming flat sheet stock when it is received. Due to the contour and shape of most aircraft parts, the process has only limited application after design and fabrication. When, however, certain flat designs are adaptable to the process, and if roller coating equipment is available, designers should not overlook the possibilities.

Spray painting is used extensively for finishing completed structures or parts too large or not adaptable to the dip coating method. One limitation of spray coating is the space required for the proper manipulation of the spray gun. Interiors of excessively sharp contour, angles, brackets, and braces may have to be touched up by hand if there is not room to apply a spray coating from all sides.

Hand brushing is the oldest and slowest method of applying a finish. When, by a little forethought, a designer can alter a part so that it can be finished in any other manner, he has contributed materially to production speed. On the other hand, certain complex assemblies in an advanced stage of fabrication, before reaching the



PRIMER ADHESION that Does Not Deteriorate

Permanent finish adhesion is not easily obtainable on cadmium, brass and zinc-coated surfaces. Initial adhesion may appear to be good, but in many cases, deterioration increases with age. ¶ Berry Brothers' CBZ PRIMER overcomes this tendency, practically eliminating adhesion failures. *Aging tests on zinc-coated metal, after more than four months, show no adhesion deterioration.* ¶ Berry Brothers' CBZ PRIMER embodies a new "etching" principle which greatly improves adhesion by increasing the bond. ¶ It air dries to recoat in 30 minutes; oven bakes in 10 minutes at 275°; infrabakes in five minutes; and reduces two parts Toluol substitute No. 45 to one part primer.

CBZ LACQUER

The same principle which promotes adhesion in CBZ PRIMER is also obtainable in Berry Brothers' CBZ LACQUER.

Write for a folder describing CBZ PRIMER for finishing cadmium, brass or zinc surfaces.

See our catalog in Sweet's Product Design File

BERRY BROTHERS, Inc.

Quality Finishes Since 1858

INDUSTRIAL VARNISHES • ENAMELS • LACQUERS

DETROIT 7, MICHIGAN • WALKERVILLE, ONTARIO

JERSEY CITY • BOSTON • CINCINNATI • CHICAGO • ST. LOUIS

paint shop, may require considerable hand brush retouch work after all available surfaces have been painted with a spray gun.

Every Part and Assembly Presents a Finish Problem

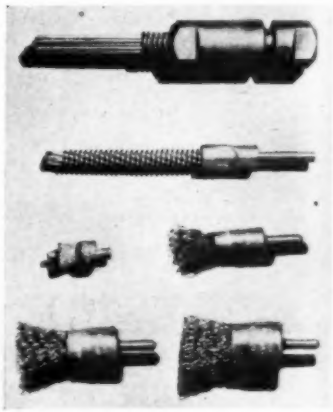
There are hundreds of different airplanes with thousands of parts peculiar to each model. Each part comprises a problem for the finish engineer. If closer cooperation between the designer and finish engineer can reduce only a few of these problems, the cumulative effect on the industry as a whole will be enormous.

This article is not intended to criticize aircraft designers. Our "men on the board" are turning out the best designed aircraft in the world today. But it must be reiterated that any design, no matter how perfect, requires complete protection, or deterioration is a certain result. No man is better adapted to foresee possible finishing difficulties than the experienced finish engineer. An exchange of advice prior to design is bound to ferret out impending difficulties before they occur, and pay well in production dividends for time and energy expended.

Wire Brushes for Metal Cleaning

WAR PRODUCTION has emphasized the value of power brushing for cleaning and smoothing various metal surfaces preparatory to painting. Power wire-brushing that removes burrs from aircraft engine parts, for instance, will also remove burrs from the parts for civilian products.

A few end-brush designs are shown in the accompanying illustration. The largest of these end brushing tools is designed for



Different sizes and styles of end brushes to reach "difficult" places.

cleaning welds. The other long cable end-brush is particularly adapted to turning bends and cleaning seemingly impossible-to-reach places. The smallest of the end brushes is for cleaning zinc chromate from around rivet holes in airplane structures to provide a better metal-to-metal bond. The three additional end brushes shown are for a variety of jobs, including the cleaning of motors and motor parts.

These and many other power brush applications will be needed in postwar manufacturing. The need for speed and the demand for higher quality will make them indispensable in the industrial task ahead.—OSBURN MFG. CO.

Paisley Adhesives Exhibited at Chicago Packaging Show

Paisley Products, Inc., 1770 Canalport Ave., Chicago 16, Ill., (adhesives, dextrines) will exhibit its products and services at the Packaging Exposition being held at the Palmer House, Chicago, March 28th to 31st.

Alluring Beauty

We suspect that you'll look twice at this photograph . . . that's allure. If your customers don't look twice at your product, our Creative Studio will be glad to supply the necessary allure.

A finish particularly designed for your product, will reveal its good qualities in an appealing manner. Then the eye will pause . . . and look again.

In case your present production is in part or entirely limited to war products, we are supplying protective coatings that meet all U. S. Government specifications.

Your inquiry will Receive Prompt Attention.

No Tampering with Quality

ROCKFORD VARNISH Company
ROCKFORD, ILLINOIS

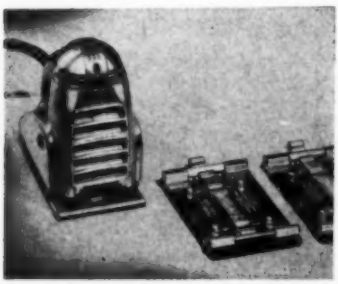
Manufacturers of Protective and Decorative Coatings

Materials Supplies Equipment

Detachable Sanding Pad for Portable Sander

A feature of the new Sterling 1000 Electric Portable Sander is the flexible sanding pad which detaches from the machine by simply pulling out a latch. Several pads loaded with abrasives can be kept near work for quick exchange. When different grades of abrasives are used on a job, additional pads loaded with coarse and fine grits can be switched when necessary, so the operator doesn't have to stop work and reload.

The Sterling Sander is specially designed to cover the entire range of abrading from coarse sanding to lapping and finishing. It provides fast, precise, uniform cutting on wood, metal and plastic. The sanding pad is flexible and will conform to convex or concave surfaces of moderate curvature. Special pads for unusual contour sanding or rubbing are also available. The tumbler action which locks on the sanding pad, can be easily operated by a key that is furnished with the machine or by a screwdriver. As tumblers are turned to lockup position, they draw in slack, pulling abrasive taut on pad. Tumblers operate with only about ¼ turn and lock abrasive securely in position.



Detachable sanding pads assure fast, easy interchange of various grades of sandpaper without interrupting work of operator.

Another feature is the non-vibrating action of the Sterling 1000 while the sanding pad is moving at a speed of 4500 oscillations per minute. In fact, the vibration is so negligible that all the lettering on the nameplate (which is small) can be easily read when the sander is in operation. This smooth performance permits the operator to use it constantly without tiring. The machine can be held without difficulty from any position with one hand.

Complete information as to operation, construction and prices can be obtained by writing to the Sterling Tool Products Co., 358 E. Ohio St., Chicago 11, Ill.

Improved Furniture Finish

A better finish for furniture, much tougher than present varnishes or lacquers, is promised after the war by the Finishes Division of E. I. du Pont de Nemours & Co., Wilmington, Dela.

A formulation described as "unique" has been developed at the company's laboratories for use as a base or prime coat. Its value lies in the extraordinary adhesion it provides for the top coat. The new so-called "penetrating primer," by affording improved "anchorage," permits the use of higher scratch-resistant finishing lacquers. Such super-tough pyroxylin lacquers have long been available, but were impractical because a sufficiently strong adhesive bond with a wood surface could not be obtained.

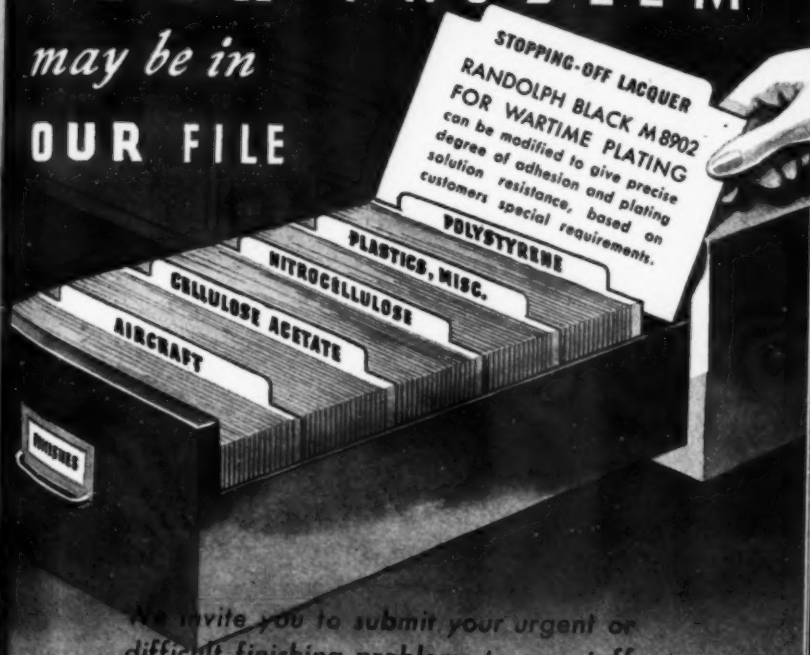
"The big research problem in utilizing tougher furniture lacquers to

The answer to

YOUR PROBLEM

may be in

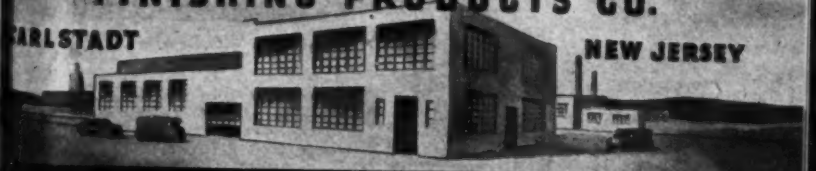
OUR FILE



We invite you to submit your urgent or difficult finishing problems to our staff of experts for quick action.

RANDOLPH

FINISHING PRODUCTS CO.



DOPES · LACQUERS · ENAMELS

resist wear, tear and scratching," explains R. C. Peter, Du Pont Industrial Finishes Division development manager, "is a struggle between cohesion and adhesion. Visualize, for example, a table top to which has been glued sheets of paper and metal. While it is impossible to strip off the paper, the metal can be removed with little difficulty, despite the fact that the strength of the glue is identical in both instances. The variable here is the difference in the cohesion of the two materials, that is, their ability to hold together.

"When the cohesion of a lacquer film over a surface so exceeds the adhesion, it can be too easily chipped from the underlying surface, as in the case of the metal sheets. The new first-coat material has a special elastomer, or rubber-like ingredient, that securely binds the top coat to the wood."

Paasche Automatic Airline Drain

Paasche Airbrush Co., 1917 Diversey Parkway, Chicago, Ill., has developed and placed on the market a dependable unit for automatically draining water from the compressed air line or air-receiving tank. It does away with troublesome manual opening and closing of drain valves. As water collects in the pipe line, it flows into the automatic drain. Weight of the accumulated water opens the valve automatically; the water is ejected then the valve closes.

The air line drain does not take the place of the Paasche airconditioner, a highly efficient unit for extracting water, oil and dirt from the air line, but is used as an adjunct to the airconditioner. Also used on air-receiving tanks to clear most of the accumulated water.

The cylindrical type strainer screen at the air inlet prevents rust, scale or foreign material from entering the drain. The strainer can be removed and cleaned quickly without disconnecting fittings or the drain from the air line.

Solvent Emulsion Cleaner

A solvent emulsion cleaner, Pennsalt E. C. No. 10, developed by Pennsylania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7, Penn., combines soap emulsifying action with solvent penetration. Composed of emulsifying agents and suitable solvents, it is of the self-emulsifying, non-phenolic type.

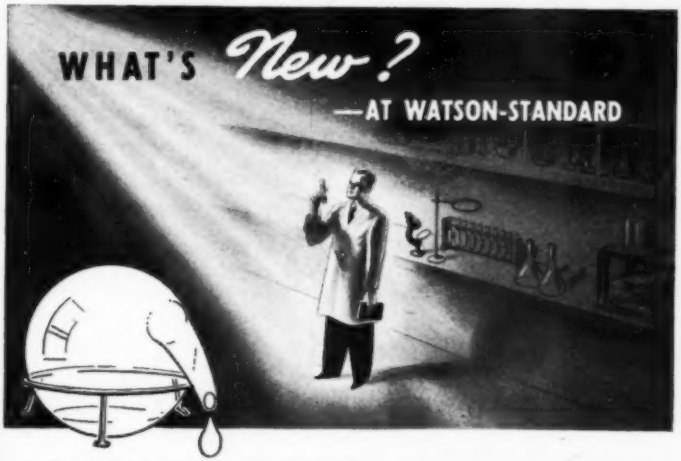
Suggested uses are for removing grease, oil, smut, and drawing and buffing compositions from metals and painted surfaces. Undiluted material may be applied cold by dipping, spraying, or brushing. It is also applicable to power washer cleaning in water emulsion form. Packed in 55-gallon drums, it is available in commercial quantities from Special Chemicals Division of the manufacturer.

Copper Coating Steel by Cuprodine Process

A practical method of copper coating steel and iron surfaces without electroplating involves the use of "Cuprodine," a product of the American Chemical Paint Co., Ambler, Penna. Of the several possible reasons for applying a thin adherent copper coating to steel and iron products, one of the most important during the war effort is to utilize the copper coating as a "drawing medium" to facilitate the drawing (forming) of sheet steel cartridge cases.

Test data available at the present time indicate that it has increased die life from five to ten times that obtained without its use.

The Cuprodine method of copper



INSULATING VARNISH

A typical example of Watson-Standard creative research is a new formula for Insulating Varnish, developed in response to a Government Department's request. "V-2315", as the new formula is called, makes use of non-critical materials, has *heat endurance* and high *dielectric strength*, and is resistant to water, acids and alkali. It is one of a very few such products accepted by the Department as meeting its extremely high standards. Watson-Standard Laboratories are constantly engaged in research designed to develop the answers to your everyday problems. Inquiries are welcomed.

WATSON-STANDARD CO.

Manufacturers of
PAINTS · VARNISHES · INDUSTRIAL
FINISHES AND LITHOGRAPH COATINGS

FACTORY AND GENERAL OFFICES:
PITTSBURGH, PA. · WAREHOUSES:
BOSTON, BUFFALO, DETROIT, NEW YORK

TOUGH JOB HEADQUARTERS

℞ **Prescription Finishes**

Give us your metal coating problem. We guarantee you an answer based on your conditions, and not just a standardized formula.

coating steel and iron has been generally adopted in wire mills and in small arms steel cartridge case plants. There is a large field outside these industries in various types of drawing and forming operations where the efficiency and economy of this new method will be applied. It offers marked increase in die life, reduction in metal pick-up, improved quality of drawn parts, freedom from scratches and minimized breakage.

A typical process applied to steel cartridge case cups prior to drawing includes the following steps:

1) Alkali clean.
2) Anneal for 30 minutes at 1300°F.
3) Pickle and rinse thoroughly in running water.
4) Immerse for three minutes in a solution containing 4-oz. of Cuprodine per gallon of 3% by volume 66° sulfuric acid at a temperature of 100° F.
5) Rinse in cold running water.
6) Rinse in hot water containing 10-lbs. per 100 gallons of neutral soap.
7) Dry by means of heat.

Metal Parts Washer

The machine illustrated here, manufactured by the Industrial Washing Machine Corp., of New Brunswick, N.J., is known as the Segmented Cabinet washing machine.

Inside it has a large mesh turntable (or special fixtures, depending upon the nature of the work to be cleaned) which rotates slowly. Surrounding the turntable is the housing which is portioned off into various combinations of washing, rinsing (or slushing) and drying operations.

Has interesting production features.

Parts to be cleaned are placed either directly on the mesh or on the fixtures. As the turntable rotates it carries the work through the cleaning operations and returns it to the operator who does the loading.

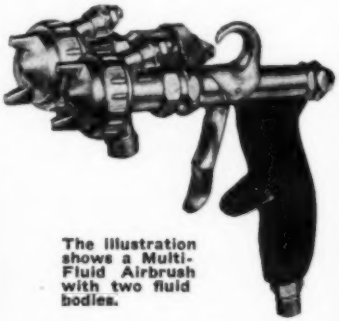
Production ranges from 2 to 10-sq. ft. of work per minute.

Features of this machine are:

1) Only one operator needed.
2) Small floor space (11x7-ft.).
3) Excellent spray coverage.
4) Skilled operator not needed.
5) Any of the cleaning detergents now on the market can be used.

Multi-Fluid Airbrush

Mixing two or more materials in the air as they are applied to the surface being coated is the unique feature of the Paasche Multi-Fluid Airbrush, Type F1020. One of the principal uses of this gun is the spraying of latex and ascetic acid, mixing the two fluids in the air as they are being applied. For the application of latex the airbrush is equipped with stainless steel lined fluid bodies, stainless steel tips and needles. The airbrush is also used for applying two or more colors together to produce blended effects.



The illustration shows a Multi-Fluid Airbrush with two fluid bodies.

The needle valve of the special fluid assembly connected to the main body of the airbrush is actuated by a pis-

Guardsman
AVIATION FINISHES

GRAND RAPIDS VARNISH CORPORATION
GRAND RAPIDS, MICHIGAN

NO NO THE

Give Wings To Production

— Save Finishing Time
— Cut Operations
— Reduce Costs

Guardsman Aviation Finishes can do for you what they are doing for others

Get the Facts

Exclusive Product of

GRAND RAPIDS
VARNISH CORPORATION
GRAND RAPIDS · MICHIGAN

Continuously supplying finishes to Wright Field since 1935.

ton in an air cylinder, thus simultaneous operation is effected by pulling the one easy-action trigger. The airbrush is also supplied for 3-color or material application.

Each spray pattern is controlled individually from small round to wide fan by a calibrated adjustment. The position of one fluid assembly is adjustable so the spray patterns can be made to converge and the materials mixed in the air, or the materials may be applied separately to produce 2-tone effects, when different colors are used. Manufacturd by Paasche Airbrush Co., 1909 Diversey Parkway, Chicago 14, Ill.

Miskella Infra-Test-Kit

The Miskella Test-Kit is just what the name implies—a compact, portable, extremely flexible quality product, universally adjustable for infra-red tests and demonstrations. It is contained in a sturdy carrying case which may be used as a table while testing or experimenting; may be checked as baggage when traveling.

Complete, it weighs 30-lbs.; size, 36x12x12-in. It is wired for 115-volts unless otherwise specified; operates on either AC or DC. Supplies temperatures from 70° F. to 400° F. Heat Units are insulated with compressed Fiberglas. (Either clear or reflector lamps may be used).

The Test-Kit contains 1000-watts of concentrated electric power, packed into a very small space and ready to deliver 3000-btu's of infra-red heat instantly (when on full). It bakes paint in a few minutes before your eyes. . . . It is a product of Infra-Red Engineers & Designers, 1633 E. 40th St., Cleveland, Ohio.

Mearl Labeling Machine

More than ten times faster than hand labeling. The machine shown in the accompanying illustration has been developed, perfected and manufactured by The Mearl Corp. of 153 Waverly Place, New York, N.Y. It will label cans and pails up to ten gallons in size.

The operation of the labeling machine is comparatively simple. After the label has been passed over the adhesive roller and placed on the can, it is then pressed on to the can by the machine which is operated by compressed air. The lever shown on the right hand side controls the operation of the air cylinder

It operates by compressed air.

which forces the can upward against the press block, which smoothes out the label and presses it firmly to the can. For different size cans or pails press blocks are easily changed to suit the size of the can to be labeled.

There is a control valve on the airline near the air cylinder which regulates the flow of air and consequently the speed of operation. Wherever the machine has been used it has shown a tremendous saving of handling and time and the label is affixed to the can more securely and much smoother than by the normal hand operation.

VICTORY
WRINKLE
FINISHES
without CHINAWOOD OIL
With the main source of chinawood oil in enemy hands, temporarily, our research laboratory was given the problem of developing a good wrinkle finish without this critical material. The result has been highly satisfactory. Victory Wrinkle Finishes give results similar to our well known DUART WRINKLE FINISHES, and are being successfully used in production. Current production experience proves they provide a tough, durable finish of the desired pattern and cover surface imperfections in a single coat, using ordinary methods of application. They are supplied in a full range of colors. Your inquiry is invited.
Formula for a quick "Finish" Buy more WAR BONDS
M&W
MAAS & WALDSTEIN COMPANY, NEWARK, N. J.
PRODUCERS OF LACQUERS, ENAMELS, SYNTHETICS AND SPECIALTY FINISHES FOR ALL PURPOSES
BRANCH OFFICES & WAREHOUSES: 1658 CARROLL AVE., CHICAGO, ILL. • 1228 W. PICO BLVD., LOS ANGELES, CALIF.

Enamel Blisters Over Zinc Plating

We are having trouble with enamel that we apply over electro-zinc plated surfaces. The enamel blisters when baked at a temperature of 250° F. for one hour. First these boxes are electro-zinc plated to .0005 to .0006 thickness. We then apply a light coat of zinc chromate primer, which is baked for one hour at 250° F., and then two coats of enamel are applied.

We have tried applying enamel over the plated surface without the zinc chromate primer and still experience blistering. We have also applied this enamel over a plain steel surface and the finish turns out without any blisters.—C. E. Co. (Metal Furniture).

There may be any one of two or three real causes for this trouble. In the first place, a new smooth zinc surface (untreated) doesn't present what is desirable for paint adherence. Also, zinc has a low-melting point.

Some experienced men to whom we have presented this problem, offer the following suggestions:

1) Try baking your paint coatings at a lower temperature if you are sure your oven temperature doesn't now exceed 250° F. at some points. You might try 235° F. or 220° F. This may prevent the blistering. It will require some experimenting to determine just how much baking temperature reduction (if any) is needed, while at the same time retaining sufficiently high heat to properly bake your enamel.

2) Put on a heavier electro-zinc plating — perhaps twice as heavy as the thickness you mention. You may need to do this in addition to carrying out suggestion No. 1.

Questions and Answers

3) Apply and then wipe off a liquid preparation especially formulated for treating galvanized and zinc or zinc-coated surfaces to minutely etch the zinc surface so that the paint coating will adhere to it more securely and more permanently. In a letter we are giving you the name and address of a manufacturer of such a material. This concern will furnish detailed instructions on how to use the material. It is possible that surface treatment with this material might solve your problem.—ED.

Filler-Stain Without Padding or Rubbing

We are interested in a filler and stain combination that can be sprayed and need not be padded in and rubbed or wiped off. Is there such a product on the market today? We have been using a combination stain and filler which is applied with a brush. Then, when dry, it is padded in and the surplus is rubbed or wiped off. The idea is to eliminate this extra work and mess by using a filler and stain combination that can be sprayed on and does not have to be rubbed off. We would ap-

"NEW WOOD"

Eliminates imperfections in Nature's Woods—Essential for smooth level surfaces and blemish-free finishes.

EASY TO USE

WITH OR WITHOUT PRIORITY

"NEW WOOD" is a pliable wood putty. It takes all types of stains, varnishes, lacquers, enamels.

"Hardwood finishing headquarters since 1888"

H. BEHLEN & BRO., Inc.

10-12 CHRISTOPHER STREET NEW YORK CITY

preciate any information on this matter that you can give us.—H. CASKET CO.

We know of no filler or combination filler-stain that can be used properly without padding the filler into the open pores of the wood, and then rubbing or wiping off the surplus. If the filler is not applied sufficiently heavy to allow it to be padded in and the surplus rubbed off, you will not get the pores filled properly, and you will not get a leveled smooth surface, which is what is generally desired as the foundation for a smooth level finish.

Perhaps your trade will accept finished wood caskets that do not include filling—just staining, plus one or two sealer coats followed by light sanding and then a final coat of lacquer, varnish or synthetic material. Omit filling and you get away from the padding in and rubbing off operation. The finished surface will not be really smooth (that is if the wood is porous like chestnut, oak, etc.), but it may be acceptable in wartime. You might give it an attractive name and it may become not only acceptable but popular. Otherwise, use close-grained wood that doesn't require filling.—ED.

Coating Flints for Your Cigarette Lighters

We are sending you samples of cigarette lighter flints, unfinished and finished with a red coating. We want to know the best way of coating these flints an even red color. We have tried spraying and tumbling without proper results. We find that the flints are either not completely colored or that they stick together, in the case of the tumbler. Any information you can give us about this matter would be appreciated.—B. Mfg. Co.

These flints (about 3/32-in. in diameter and ¼-in. long) can probably be coated to best advantage by a combination dipping-whirling operation.

Machines for the dip-whirling method of coating are on the market, and if you can obtain one of these of small size, we recommend it. You may need a high priority and you may have to wait some time for delivery, as these machines have been very much in demand for coating small parts used in war production.

If you must have something immediately, you might try some makeshift equipment designed and made according to the following suggestions:

You will need a small container (about pint or quart size) made of fine mesh wire that has openings small enough to hold the flints. This paint-can size mesh container will need to be reinforced with a framework of heavier wire or strips of sheet metal, and it must be equipped with a suitable handle or bail to allow it to be dipped into and drawn from your coating material.

Then you will need a larger diameter cylindrical container (the size of a 1-gallon or 2-gallon paint can). Inside and centered near the bottom of this cylindrical container, you will have a vertical shaft (projecting up through the bottom) which can be rotated at a speed of 300 to 600 r.p.m. The vertical shaft, where it extends down beyond the bottom of the container, is mounted in bearings and driven, through V-belt or

"RINKOLIN"

a new wrinkle finish

made from LINSEED OIL

Why should we forsake linseed oil for oiticica or any other vehicle that may again become available when users write of RINKOLIN:

1. **"It has done by far the best job for us of any wrinkle finish used in the past."**
2. **"In our opinion its qualities exceed those of any previous finish of the same type."**

Our files are full of such bouquets—names gladly furnished on request.

SINCE 1870

STANDARD VARNISH WORKS

2600 Richmond Terrace
Staten Island, New York

2600 Federal Street
Chicago, Illinois

worm gear, by a small motor. The top of this shaft (where it projects up into the gallon container) will be fitted with some kind of skeleton cup-like framework which will receive and hold in position the wire mesh container of dip-coated flints.

With your mesh container ½ or 2/3 full of loosely packed flints, you dip same into a container of well agitated finishing material, letting it remain submerged long enough to allow the coating material to reach all flints in the mesh container. Then lift the container of flints from your coating liquid, holding it a few minutes to let most of the excess material drain off, and then place the dripping container in the cup-like frame on the vertical shaft inside the solid container.

Now turn on the power and rotate your mesh-wire loaded container to throw off the excess paint quickly. Some experimenting will be necessary to determine how long to rotate it; perhaps a few seconds or half a minute may be long enough. The excess paint will be thrown off by centrifugal force and deposited on the inside of the gallon stationary container, inside which the vertical shaft rotates.

Now lift the mesh wire container from its holder and dump its contents on a fine wire-mesh tray. Scatter the flints about over the level surface of the tray and allow them to air dry—or let the paint set a few minutes at ordinary room temperature and then place the trays in an oven to bake the coating. Vibrating or shaking the loaded trays a few times during drying will help tc prevent the coated flints from sticking together.

Your coating material will need to be especially formulated for this method or process of finishing. A highly pigmented lacquer or synthetic, such as is used for coating shells, might serve your purpose very well. The material should have no gummy or sticky varnish or oil in its make-up. Your supplier of coating material can formulate something suitable if a stock item is not available.

Even under the best of conditions, a few of the coated flints may temporarily stick together, but if you are using a satisfactory coating material for this purpose, these stuck-together flints can be easily separated.

Probably a local mechanic or perhaps a man in your own organization can make the equipment I have briefly described. Some experimenting with the various details should place you in position to do the coating job satisfactorily and economically—until you can purchase and get delivery on a regular dip-whirling machine.—C. M.

"Resimene" Monsanto Products

All melamine resins and molding compounds produced by Monsanto Chemical Co. (Plastics Div'n., Springfield, Mass.), are now being sold under the trade name "Resimene," according to an announcement by F. A. Abbiati, general manager of sales of the Plastics Division of the company.

Correction in Duralac Ad; "Curing" not "Curling"

In the Duralac Chemical Corp's. full-page advertisement in Feb. issue, page 85, entitled "Sea-Lac Facts," you read in the second paragraph of small type, third line, "quick air dry, no heat curling." The word "curling" should be "curing." Please mark this in your Feb. copy of INDUSTRIAL FINISHING, as your copy will probably be referred to and read by others as well as yourself, from time to time in the future.—ED.

A.C. HORN PRODUCTS
1897–1944

DEPENDABLE

A word exactly describing

HORN INDUSTRIAL FINISHES

A reputation for dependability is no accident. Earned only by continuous reliable performance, it is an achievement of merit. Pioneers in the invention of methods and products for protection and decoration. Horn has had 47 years of experience in providing dependable finishes.

The Horn Policy

"Produce for our customer the finest finishing product for his purpose at the lowest possible cost to him."— A.C. Horn

Interested manufacturers are invited to enjoy the advantages provided through this experience and trained personnel, available on inquiry—address

A. C. HORN COMPANY
PRODUCTS FINISHING DIVISION
LONG ISLAND CITY 1, NEW YORK

CHICAGO • HOUSTON • LOS ANGELES

Booklets Catalogs Circulars

Paint Recovery Procedure for Water-Wash Spray Booths

A folder published by Colloidal Paint Products, Co., 6140 Charles Ave., Detroit, Mich., gives complete directions for cleaning water-wash spray booths and using certain products (Bricate, Linotal) the company offers to coat water-washed surfaces and to condition the water that is circulated in the booth so the sludge can be collected for reclaiming. This folder contains some interesting information of value to every user of spray booths, and it is free.

Big Catalog of Supplies for Finishers and Cabinet Workers

A new alphabetically-indexed catalog containing more than 200 pages 8½x11-in., lists hundreds of practical specialties and supplies for finishers, refinishers, cabinet makers, furniture workers, repairmen and general handymen. Here is something of interest and value for every establishment that does any kind of finishing, refinishing, repairing or manufacturing—small or large. The book lists many items that are not generally known to some of the experienced workmen.

Specialties, supplies and accessories of practically every description are illustrated and described. For example, finishing repair kits, burn-in knives, graining rollers, small spray outfits, brushes, abrasives, hand and portable sanders, cabinet makers' and furniture workers' tools, adhesives, finishing materials and solvents, putties, cleaners, cabinet and furniture hardware, sticks of different materials and colors for making burn-in repairs on damaged finishes, upholsterers' supplies, etc.

The catalog is a loose-leaf book of numbered pages bound in a substantial binder. It was compiled and copyrighted by Elmore W. Hagadorn, President and Founder of Finishine Laboratories, Inc., Syracuse, N. Y. The catalog is well printed on high quality paper and makes a valuable reference book for workmen and executives who use any of the materials or supplies mentiond.

Chemical Book Free

The new 144-page catalog, "Chemicals by Glyco" of the Glyco Products Co., Inc., Brooklyn, N.Y., has just been released. Additions have been made including a number of plasticizers for synthetic rubber, synthetic resin, etc., as well as further information on the esters manufactured by the company. The usual features have been retained and the manual is complete with formulas, suggestions and tables of useful chemical and physical data. All chemists, technical workers and executives are invited to write to the Glyco Products Co., Inc., 26 Court St., Brooklyn 2, N.Y., for a free copy.

Free Booklet on Fire Retarding

A demand for fire-retardant materials, which also provide resistance to mildewing, weathering, water and other solubilizing agents, was brought about by the widespread use of war supplies under all types of weather conditions in all parts of the world. To meet this demand, a Zinc Borate of low water solubility was developed by The New Jersey Zinc Co., and is called Zinc Borate-3167.

Zinc Borate-3167 has been used in the war effort in large quantities, especially in fire-retardant compositions for treating textile fabrics such as camouflage nettings, osnaburg cloth, cotton duck, and cotton drill. Generally, resinous-like chlorinated hydrocarbons are used in conjunction with Zinc Borate. This product is also incorporated in electric cable sheathing to help prevent the spread of any fires on shipboard.

The story of Zinc Borate-3167, including its physical and chemical properties, is revealed in a new booklet recently issued by The New Jersy Zinc Co. Address their Development Products Division, at 160 Front St., New York 7, N.Y.

Metal Cleaning Data Sheets

Nielco Laboratories, 19720 Florence Road, Detroit 19, Mich., has prepared a set of five data sheets, with illustrations, which give timely and practical information about alkali cleaners for use in war plants. Copies of these can be obtained free by writing the concern at the above address.

ALAKA LACQUERS

ARE

RESISTANT TO VARIOUS CHEMICALS

Resistance to a specific chemical in the application of finishing material is an old story to ALAKA research technicians. They have spent a lifetime finding the answers to just such questions.

We have created finishing material that resist High Octane Gasoline • Aromatic Solvents • Hydraulic Fluid • Salt Spray • Methyl and Ethyl Alcohol • Sudden Temperature Changes • De-icing • Sun • Rain • Snow • Hail • Water and other causes of corrosion. Alaka meets and in many instances exceeds government specifications.

WHATEVER YOUR FINISHING PROBLEM

TAKE IT TO ALAKA

Send for your copy

Write us on your letterhead and we will send you a copy of our new, complete, up to the minute catalogue of U. S. Government Specification Finishes.

ACQUER & CHEMICAL CORPORATION • 214-220 FORTIETH ST. • BROOKLYN 32, N. Y.

Industrial FINISHING

Distributed monthly to finishing room and paint shop foremen, production superintendents and company officials of metal-working, woodworking and miscellaneous industrial plants where production cleaning and finishing are major operations in parts and products manufacture.

•

Published the 15th of each month by
PRACTICAL PUBLICATIONS, Inc.
1142 N. Meridian St., Indianapolis 4, Ind.
Telephone.....Riley 6771

•

President.....W. H. Rohr
Vice-President.....E. A. Dosch
Secretary-Treasurer.....R. E. Suits

•

Subscription Rates Per Year
U. S. and Possessions.....$2.00
Canada and Foreign Countries.....$3.00
(No subscription solicitors are employed)

Editorial

Just What Paint Does and Why We Use It

★ Paint, or some related coating material which is applied in liquid form and which dries into a thin adherent film, is something that thousands of manufacturers use every day. I am not an authority on the history of paint, but I believe it is safe to say that as far back as we can find traces of civilization there is evidence that paint, in one form or another, was used.

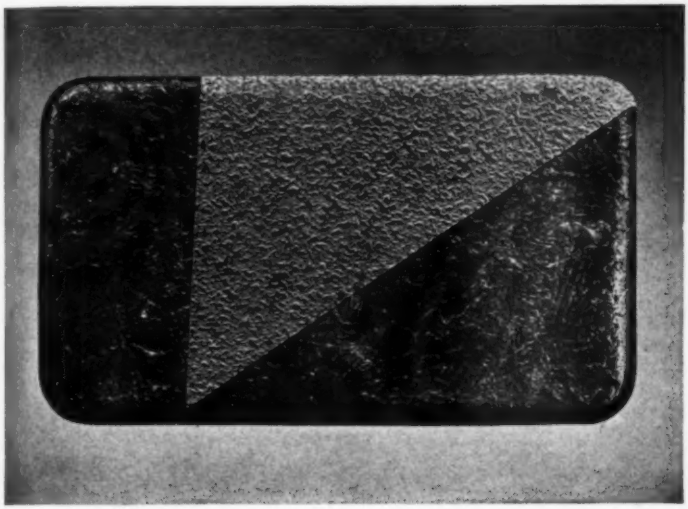
We who manufacture and use paint in our everyday life take it for granted. Sometimes we fail to realize that if it were not for paint many of the outstanding achievements in this world of science would not be possible—or, at least, they wouldn't have achieved anywhere near their present position.

The prime purpose of paint is to protect. Our automobiles, airplanes, bridges, homes, buildings, etc., would not have very much life or resistance to the elements if it were not for the protective qualities of paint.

Of secondary importance is the beautifying quality. Many of us, when we buy furniture, an automobile, or a refrigerator, base our opinion of the article purely on its appearance. Few of us know much about the inner construction of furniture or the mechanical operations of a refrigerator. We just assume that if the appearance is satisfactory, so is the mechanism. Ask any real estate agent or used-car dealer the increased value of a house or an automobile that has a first-class paint job, compared with one on which the paint is in a run-down condition.

Of third importance is the luxury or convenience that paint affords. I don't know that I have ever read about or heard any men-

★ Guest Editorial . . . Many readers can write an excellent editorial—two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.



Lowe Brothers Modern Texture Finish For Rough Castings

The fine finishes on the majority of machine tools before the War were designed by The Lowe Brothers Company. They not only protected the machines from cutting liquids but also provided a finish that commanded the respect of operators and insured the proper care so necessary to their best performance.

Fine tools were deprived of this quality finish when Limitation Order L-108 prohibited filling operations. The Lowe Brothers Company met the emergency within a few weeks by developing MODERN TEXTURE, *the pebble finish which camouflaged the rough cast surface and gave a tough, protective finish that fully complies with the Limitation Order.*

MODERN TEXTURE *finish has many outstanding characteristics which make it an excellent finishing system—not only for machine tools, but for any cast iron equipment where the cost of a smooth filled job is prohibitive. It eliminates filling, requires no baking, and yet produces an excellent finish with either two or three coats.*

Investigate this new finish now for the answer to your finishing problems —present and future. You can rely on Lowe Brothers broad experience with government specifications for machine tool finishes and industrial finishes of every type.

INDUSTRIAL SALES
THE LOWE BROTHERS CO.
DAYTON, OHIO

Lowe Brothers
WARTIME FINISHES *for Industry*
IN ACCORDANCE WITH U. S. GOVERNMENT SPECIFICATION

tion of this point. The paper on which this type is printed is white. As far as I am concerned the paper isn't particularly pretty. I believe either pink or blue would be prettier. However, the reason this paper is pigmented white (in much the same manner as paints are pigmented and with the same pigment or pigments used in paint) is not to: 1) protect the paper, or 2) for beautifying purposes; but rather it is to make the type easier to read—to make the reading easier on our eyes. In recent years there has been much research on fluorescent paint. This type of paint is interesting, not because it protects or beautifies, but because it is used to afford luxury and convenience.

There are numerous examples in our everyday life where we use paint for luxury and convenience. I believe that more and more emphasis will be placed on this property. We are living in a great day of scientific development. Paint is playing a real part in this development.—R. C. ADAMS.

Avoid Postwar Distress Stocks Headache

★ The day Germany quits the war, possibly before, we will see the cancellation of many war contracts. To those of us who have already seen lists of distress stocks, comes a realization of the probable amounts of raw materials in our own industry, which will fall in this class later. Vast quantities of resins, pigments, etc., will be left in the hands of paint manufacturers.

Of course, most war contracts make provision for this event, and these surplus stocks can be charged back to the Government. That's the easy way. But sooner or later these materials will be back into circulation to plague us, in the form of cheap paints competing with standard lines.

To do it the easy way will cost the Government real money and ourselves many headaches. Let's eliminate both of these possibilities by finding a use for these materials in our regular lines. Of course, it will require a lot of ingenuity. It will mean more work and more bother; but it's patriotic and it's sensible! Let's try!—H. H. MILLER.

Random Comment on the Industrial Scene

BY LAWRENCE H. SINGER

Postwar Fuels — We recently had the privilege of interviewing Dr. Gustave Egloff, world-famous for his research in high-octane gasoline. The Chicago scientist, who is President of the American Institute of Chemists, has made a significant contribution to Allied victory in this war.

Dr. Egloff authorized the following statement: "In connection with postwar gasoline, the cost will be somewhat more per gallon than present prices, but economies in mileage will be more than doubled. The cost of the motor will be much less, with less noise and vibration in the car."

* * *

Bright Colors Ahead—Addressing a postwar marketing conference sponsored by the New York Paint, Varnish and Lacquer Association, Ray Coates of R.C.A., forecast an abrupt departure from the dreary shades of paint now applied to commercial and industrial equipment. He expects to see

CREATING TOMORROW

When the strains of "Stars and Stripes Forever" resound through the sullen silence of Unter den Linden . . . "When the lights come on again all over the world" . . . what then? The curtain will rise upon a new world . . . new materials . . . new processes . . . evolved through the urgent needs of war.

Tomorrow is the chemist's. The world waits palpitant . . . senses laboratory discoveries . . . many under war wraps. Coatings! A forward surge. New formulae . . . startlingly different . . . save money, save time, save customers. Durable as leathernecks.

About your product finish. It rates research. Yesterday's achievement will be tomorrow's reject. WE KNOW. We have to.

Write us. It involves no obligation. Address The Stanley Chemical Company . . . manufacturers of Stanley Lacquers, Enamels, Synthetics and Japans . . . East Berlin, Connecticut.

Stanley Chemical

peacetime finishes furnished in a wide variety of gay tones.

In describing industry's requirements in finishing materials, Mr. Coates laid special emphasis on faster-drying baking schedules, and corrosive-resistant air-drying synthetics.

* * *

Home Freezer Prospects—Within two years after the war, a million low-temperature home freezing units will probably be sold in this country, according to a survey made by *Electrical Merchandising*.

Less than 5000 locker plants are now in existence, continues this publication, and they are chiefly patronized by families in rural areas. But experience has demonstrated the enormous savings and attractions offered by this type of appliance. The ardors of canning are avoided, and fresh food is available every day.

* * *

Facing The Facts — The commendable trend towards frankness in advertising is once more illustrated by an amusing magazine release sponsored by Monsanto Plastics.

"A plastic frying pan would be light, easy to handle, easy to clean," reads this ad, "but once you tried to fry your breakfast bacon in a plastic frying pan—you'd never buy another."

Blunt talk of this caliber is going to win many friends for industrial producers. We heartily endorse the trend!

* * *

Citrus Miracle — In the course of a southern journey, we spent a day visiting what is probably one of America's most remarkable factories. It is the plant of Citrus Concentrates, Inc. at Dunedin, Florida.

You will soon be reading details of the astounding list of products being manufactured in this community, the sole raw material being oranges and grapefruit. In addition to the concentrated citrus juices being packed here for the Army, Navy, and Lend-Lease, we saw oranges going into giant crushers, and coming out in an incredible procession of industrial goods.

Terpenes, the bitter element in orange peel, is being utilized in an undisclosed chemical process. Pectin is extracted, in the form of a white powder, and is used as a battlefront substitute for blood plasma. Other prospective derivatives are menthol and camphor. Additional by-products turned out in substantial quantities are cattle fodder and backstrap molasses —all obtained from fresh fruit!

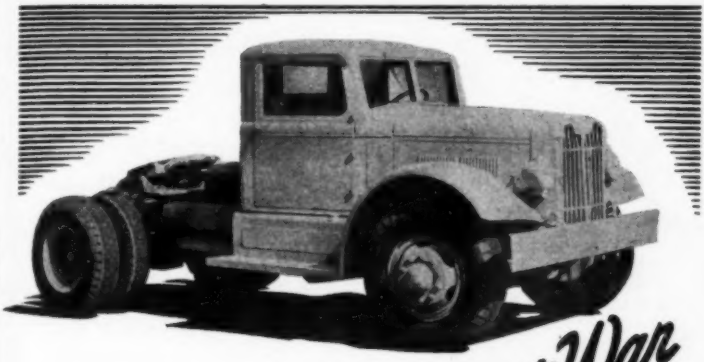
Chemists are working on numerous other postwar processes, and we may eventually find the orange as versatile an industrial material as coal or lumber.

* * *

Boom In Sponges—If any industrial consumers of sponges question the steep quotations being given them nowadays on this item, we can vouch for the validity of the figures. We visited the world's largest sponge market at Tarpon Springs, and saw a quality of sponge that brought $2.00 in 1938 being knocked down for three times that price. The end of the European phase of the war, of course, would probably cause a change in the picture.

* * *

Furniture Puzzle — Apparently the furniture trade is in a dither as a result of the order releasing steel springs for upholstered goods. Now the industry is faced with the necessity of making immedi-



A GLIMPSE INTO *Post-War*

AUTOCAR . . . one of the Nation's largest producers of Army Half-Tracks and other specialized war vehicles . . . has been authorized by the government to build 2727 of the largest heavy-duty commercial-type trucks this year. Significant evidence of Autocar's position in the heavy duty truck field . . . now and in the post-war.

FERBERT-SCHORNDORFER finishes are used because "tailor-made" to the exact production processes, they help speed production . . . result in more lasting protection. Your inquiry will bring full details of our cooperative plan of service to metal products manufacturers. It goes far beyond the mere furnishing of finishes and has been helpful, customers tell us, in their present production and in their post-war plans.

★ F-S ★

THE FERBERT-SCHORNDORFER CO.

12815 ELMWOOD AVE. • CLEVELAND 11, OHIO

I. C. D. FORMULA NINE

NON-INFLAMMABLE « *wax free* REMOVER »

for paint, varnish, lacquer, baked enamel, adhesives

EASY TO APPLY—NO AFTER-CLEANING

ORDER TRIAL GALLON AT DRUM PRICE

I. C. D. FORMULA 9 is the standard of safety and quality . . can be sprayed or brushed . . doesn't raise grain nor discolor . . quickly removes all kinds of finishes and coatings . . costs less to use . . saves time, labor and material.

SPECIALTY COATINGS—I. C. D. Labs. have specialized in the formulation and manufacture of non-inflammable coatings and substitute finishes. If you have a tough coating or finishing problem send in your specifications, finishing schedule and requirements. Immediate action and a prompt reply promised.

INDUSTRIAL CHEMICAL DEVELOPMENT CORP.

RUDD

LACQUER CORPORATION

SPEEDROY

RUDLACO

NOROY

UNIFORMITY · QUALITY · PERFORMANCE

127 MAIDEN LANE

NEW YORK, N.Y.

FACTORY - RAHWAY, N.J.

ate decisions on the judicious disposal of "ersatz" merchandise.

"While quite a few retailers became somewhat panicky and started clearing their stocks of furniture," reported a leading observer in the New York Times, "most merchants followed an orderly plan of disposing of their merchandise." The analysis, prepared by McGreevey, Werring and Howell, Inc., continued by pointing out that it would be a matter of many months before enough springs are produced to serve adequately.

* * *

Autos in 1944? — It would be possible to start turning out new cars before the end of this year, in the opinion of Charles L. McCuen, vice-president and engineering chief of General Motors.

These autos would not be the "dream" designs nor the $400 economy models predicted in some quarters, he cautioned. In outward appearance, they would be only slightly different from 1942 patterns, and current costs would probably require a 20% increase in selling prices.

General Motors is geared for speedy resumption of production, says Mr. McCuen. "If the war should end at noon today, we could be functioning on automobiles within an hour."

* * *

Sound On Cellophane — Cellophane twice the thickness of cigarette wrappings is being used for sound-recording film, in an interesting new device developed by the Fonda Corp.

About the size of a portable radio, the mechanism can be plugged into a radio, telephone or microphone to make recordings. It will play eight hours without change. At present, the machine

NEW PERIOD
WOOD and METAL
FINISHES

CONVERSION

We hear a great deal about conversion and reconversion these days. To many firms it means retooling and rearranging machinery to handle civilian production. It also means better and faster drying finishes and more modern finishing production methods.

Our business is conversion. We select the best and most recently developed and improved raw materials, formulate and convert them into the finest finishing materials we know how to make to meet modern needs. Some of our standard NEW PERIOD finishes are listed below. If you have a special production finishing problem our laboratory would like to help you solve it.

BAKING ENAMELS
ENAMELS—LACQUERS
SEALERS—PRIMERS
SYNTHETICS
VARNISHES—SHELLAC
FILLERS—STAINS
FINISHING SUPPLIES

Working samples sent on request.

NEW YORK WOODFINISHERS' SUPPLY CO., INC.
109 IMLAY STREET
BROOKLYN 31, N. Y.
EST. 1917

The right Material for Cleaning Metal prior to finishing.

Perfect adhesion and durability of finish are the results of a chemically clean surface, and best obtained with—

PERMAG Cleaning Compounds

These fast action efficient cleaners never injure soft metal. Cleaning with PERMAG Compounds insure increased production and practically eliminates rejects. More details on request.

Magnuson Products Corp.
50 Court St., Brooklyn, N. Y.
Representatives from Coast to Coast
In Canada: Canadian Permag Products Ltd., Montreal - Toronto

CHEMICALS BY GLYCO

Plasticizers for Cellulose Acetate—Nitro Cellulose —Ethyl Cellulose and other film-forming materials.

Write for a free copy of our new PLASTICIZERS chart.

Glyco Products Company, Inc
26 Court St., Brooklyn 2, N. Y.

is being used primarily in airport control towers, but dozens of additional peacetime applications are already being envisioned.

* * *

Building Materials—Among the noteworthy developments to be offered for postwar housing are a knocked-down, easily assembled shower bath compartment, and a steel window "package" which can be installed on the job in less than 15 minutes.

These are a few of the innovations described in a bulletin issued by the Producers' Council. We are warned, however, that most new products for the construction industry which involve fundamental design changes will not be ready for at least a year after the war's end.

* * *

Eyes To The East — Business leaders are hailing the China-America Council of Commerce and Industry, organized a few weeks ago to stimulate postwar trade with our Asiatic ally.

With Thomas J. Watson as chairman, this group has already begun to lay the groundwork for future commercial relations.

China's needs will be staggering with the arrival of peace, and America's leaders are anxious to promote the flow of merchandise on a friendly two-way basis.

"Contemporary China," an official publication of Chiang Kai-Shek's government, has stated that the U. S. should supply two-thirds of the country's postwar imports.

* * *

Planning Ahead—Informal polls of railroad executives point to an impressive volume of radical planning for the postwar passenger trade. An exhaustive study on this subject has been made by "Railway Age." Coach fares will be

THE CARRIERS CLEAR THE WAY

AIRPLANES
GUN STOCKS
BOMB SIGHT BOXES
TOOL CHESTS
MARINE PARTITIONS
RADIO INDUSTRY, ETC.
SKIS
INSTRUMENT BOXES

ADMIRAL CHESTER W. NIMITZ, Commander of the Pacific Fleet, and his intrepid fliers and sailors are writing a gallant page in our Naval history. They are engaged in blasting a sealane to the Philippines. The Gilberts, the Marshalls, Truk and the Marianas have felt their sting.

All Hail to the new Capital ship, the aircraft carrier, around which is built the modern Naval striking force. All Hail to the men who fly our planes and to the men who man the ships. To the men who built them a grateful nation says "Well Done."

BACK THE ATTACK . . . . BUY WAR BONDS

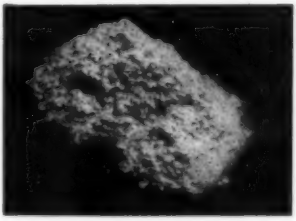
Listed here are a few of the war products now being coated with our materials. Phone, wire or write and let one of our finishing experts help you "keep production rolling."

THERE'S NO TIME TO LOSE—THERE'S JUST TIME TO WIN!

The Lawrence-McFadden Co.

Headquarters for Fine Finishes Since 1875
7430 STATE ROAD PHILADELPHIA, PA.

Solves Many Problems on Many Products . . .



FLOCK

Rayco Flock is textile fibres cut to extremely short uniform lengths, applied by adhesive to form a solid, even coating. Available in various lengths, styles, and colors.

•

FUNCTIONAL

Used in airplane, auto and numerous other industries for—

SOUND DEADENING — TEMPERATURE INSULATION — INTEGRAL GASKETS SHOCK-ABSORBING SURFACE — NON-MAR SURFACE PROTECTION.

DECORATIVE

Applied in various lengths and colors to wood, paper, cloth, metal, etc., the following effects are produced:

SUEDE LEATHER — FURNITURE UPHOLSTERY FABRICS — AIRPLANE AND AUTO UPHOLSTERY FABRICS — VELVET — VELOUR — MOHAIR.

Request Samples and Prices

RAYON PROCESSING CO. of R.I. INC. 55 TREMONT STREET CENTRAL FALLS, R. I.

slashed to a flat rate of one cent a mile if some key officials have their way.

Lightweight streamlined cars will be built in an ever-increasing flow; many railroad men state emphatically that we will never manufacture another heavyweight passenger car in this country. The old type of open section Pullman is "as dead as the dodo," in the words of one observer. The trend in sleeping accommodations will be towards the 24-roomette units, which have proven highly popular with the traveling public.

* * *

Trouble In Rubber — Some of the optimistic forecasts of recent months, concerning 1944 synthetic rubber production are being revised sharply downward. A number of unforeseen bottlenecks have arisen to alter the rosy outlook.

Shortages of both grain and alcohol are expected to impede the processing schedule, and part of the petroleum program, too, has apparently bogged down. On top of all these tangles, the Army and Navy are calling for an increased volume of rubber products. All the facts add up to a dark prospect for civilian tires and tubes.

* * *

For Visitors—Additional sponsors now cooperating with INDUSTRIAL FINISHING in distributing free radio tickets to our readers include: The Sherwin-Williams Co., America's Town Meeting, Colgate-Palmolive-Peet Co., and the Adams Hat Co.

When planning a visit to New York, drop a line for broadcast tickets to: Lawrence H. Singer, 130 West 86 Street, New York 24, N. Y.

Leakproof Air Blow Gun

Use this gun for blowing dust, dirt or lint from the surfaces of parts and products to be coated with paint or any other kind of coating. It will improve your finish tremendously.

Also useful for blowing out moisture or other entrapped liquid from crevices, seams or indentations in parts to be cleaned or painted.

Fits comfortably in the palm of hand. Has button control air valve. Special composition washers prevent leakage. We can furnish any type nozzles—round, pointed, flat or 10-in. extension. Nozzles are interchangeable and renewable. Every plant should have one or more. Write us!

G. M. MANUFACTURING CO.

Engineers, Mfrs. of Complete Spray Equipment

216 N. Clinton St. Chicago, Ill.

NALCO

Infra-Red Ray Lamps

Best for Infra-Red Ray Baking and Drying

Carbon Filament Lamps, service proven, available in Inside-Silvered (self-reflecting) or in Clear Glass types. Write for details.

North American Elec. Lamp Co.

1030 Tyler St. St. Louis 6, Missouri

D. R. Means Promoted in Pittsburgh Plate Glass

Dwight R. Means, who has been associated with the Columbia Chemical Division of the Pittsburgh Plate Glass Co. for 21 years, has been named Assistant to the Vice President. The announcement was made by E. T. Asplundh, vice-president in charge of the Division.

After attending the University of Kansas, Mr. Means joined the company as a draftsman. Prior to his new appointment he was technical director and had previously served as research director and assistant superintendent.

Drafting departments

Precision grading in all degrees

SCHREIL & BROCK
DIVISION OF
C. DEVOE & RAYNOLDS CO., INC.
Drawing Materials
NEW YORK N.Y.

Oberender of Zapon Retires

John C. Oberender, New England sales manager of the Zapon division of the Atlas Powder Co., Stamford, Conn., retired February 1, after 25 years service with the company.

Mr. Oberender joined the company in 1918 as a salesman. He was promoted to assistant manager of the firm's Chicago office, and later became assistant and manager of the New Haven office. Subsequently he went to the general office at Stamford.

John C. Oberender formerly sales manager of the Zapon Division of Atlas Powder Co., Stamford, Conn.

PAINT SALESMAN WANTED

Experienced Maintenance or Railroad Paint Salesman to cover railroads in Chicago, Minneapolis, St. Louis and Omaha. We are one of the oldest and largest paint manufacturers in the country and will turn over substantial volume of established business to right man.

This job is permanent and affords good opportunity for good earnings.

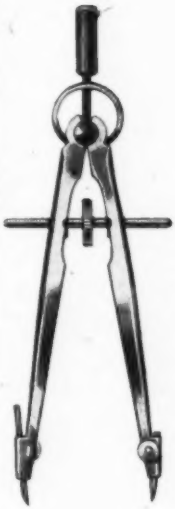
In reply, please state age, married or single, number of dependents, and draft status, and your earnings during 1942 and 1943. All replies strictly confidential.

Address: DEVOE & RAYNOLDS CO., INC., 1481 S. 11th Street, Louisville 8, Ky.

METAL SPECIALIST

Man with thorough knowledge of metals and broad experience in metal manufacturing and finishing processes. Wanted to work with present well-established technical and service organization which manufactures cleaning, cutting and grinding materials. Our products are extremely essential in all kinds of production, processing and maintenance work. Must be willing to travel. Give details regarding experience, age, salary, marital and draft status. Do not reply if engaged at full skill. Replies are held confidential. Address IF-978, care Industrial Finishing.

Industrial Designers



DYNAMIC BOW INSTRUMENT

COMPLETE LINE OF *DRAWING INSTRUMENTS*

SCHREIL & BROCK
DIVISION OF
C. DEVOE & RAYNOLDS CO., INC.
Drawing Materials
NEW YORK N.Y.

INSULATED REFLECTIVE

SECTIONAL MISKELLA INFRA-RED OVENS

Infra-Red Engineers & Designers

MAIN OFFICE and LABORATORY
1633 EAST FORTIETH STREET
CLEVELAND, OHIO

POSITION WANTED

By industrial salesman with 15 years' sales experience in Indiana and Kentucky, with one large industrial firm for 10 years as technical representative. Specializes on metal and Government specification finishing. Available after March 1. Best of business and banking references. Address IF-972, care Industrial Finishing.

VARNISH MAKER WANTED

Able to cook and formulate with possibility of interest in varnish company located in New Jersey. Opportunity not based on war business. Write for appointment at your convenience. Our employes know of this ad. Address IF-971, care Industrial Finishing.

FOR SALE

220 gal. metallic grey lacquer @ $1.85 per gal. 17,000 Forges catches @ $17.50 per M. Address COLLEGE WOOD PRODUCTS, Berrien Springs, Mich.

SALES EXECUTIVE AVAILABLE

Graduate Chemical Engineer with twenty years' experience in industrial finishing field . . has broad contacts in various industries located in territory East of the Mississippi.

Now employed as Sales Manager by manufacturer of industrial finishes doing a volume in seven figures . . has fine references . . available within two months. Desires personal interview with progressive manufacturer, East of Mississippi, who would like to initiate an aggressive sales building and sales promotion program. Address IF-976, care Industrial Finishing, Indianapolis 4, Ind.

TWO WOOD FINISHING MATERIAL SALESMEN

Wanted, one to cover Southern territory and one to cover Pennsylvania and New England, to represent well-established house producing full line wood finishing materials. We are interested only in men of good character and personality, with experience. We are prepared to turn over established business to the right men. Addrss IF-975, care Industrial Finishing.

FINISHING FOREMAN WANTED

Production man, experienced on bedroom finishes. Good proposition for right man. Permanent connection. Western N. Y. location. Living conditions good. Address IF-974, care Industrial Finishing.

SALESMAN WANTED FOR NEW ENGLAND

Progressive Eastern manufacturer of lacquers and sealers wants experienced salesman to cover New England territory. The man who applies must have good references and a successful record. Established business in the territory will be turned over to the right man. Direct your reply together with full details to—IF-973, care Industrial Finishing.

EXCEPTIONAL OPPORTUNITY

With nationally known manufacturer whose products used 100% by war industry now; equal peacetime opportunity. Salesman with industrial or automotive experience desired. Product closely allied with paints and their application. Established territories in practically every part of the country available for capable representative. Position pays salary, expenses, and bonus. Automobile required; state model. Include draft status, age and full particulars. Address IF-961, care Industrial Finishing.

WANTED.

High-grade chemist, thoroughly familiar with wood finishing materials. Draft exempt. Good salary to right man. Old established concern, making high-grade materials. Address IF-977, care Industrial Finishing.

FOR SALE

9 Hall Infra-red lamps with channel and bracket assemblies, 1941 model, unused. No priority necessary. SCHWAB & FRANK, INC., 243 W. Congress st., Detroit 26, Mich.

WE BUY DIRTY SOLVENTS

Don't throw away spent cleaning thinner, degreaser residues, etc. Send us a sample for quotations. We also reclaim for customers. DYTEX CHEMICAL CO., 267 Plain, Providence, R. I.

Index to Advertisers

Advance Paint Co. ..... Third Cover
Aluminum Industries, Inc. 45
American Chemical Paint Co. 43
Arco Co., The 75

Behlen & Bro., Inc., H. 91
Berry Brothers 79
Binks Mfg. Co. 26-27

Cellusuede Products, Inc. 40
Claremont Waste Mfg. Co. 4
Classified Advertising 110
Clinton Company, The 25
Commercial Solvents Corp. 55
Crescent Bronze Powder Co. 71

Day & Co., James B. 12
Despatch Oven Co. 49
Detrex Corporation 36
DeVilbiss Co., The 20-21
Dolan & Co., V. J. 4
DuPont deNemours & Co., E. I. 56-57
Duralac Chemical Corp. 61

Egyptian Lacquer Mfg. Co. 73
Enthone Company, The 1

Ferbert-Schorndorfer Co. 103
Ferro Enamel Corporation 31
Finishine Laboratories, Inc. 67

G. M. Manufacturing Co. 108
Glidden Co., The 23
Glyco Products Co., Inc. 106
Grand Rapids Varnish Corp. 87

Hilo Varnish Corp. 2
Horn Company, A. C. 95

Industrial Chemical Development Corp. 104
Infra-Red Engineers & Designers 110

Johnson & Sons, Inc., S. C. 29

Kirk & Blum Mfg. Co. ..... Back Cover
Koch Sons, Inc., George 13

Lacquer & Chemical Corp. 97
Lawrence-McFadden Co. 107
Lilly Varnish Co. ..... Front Cover
Lowe Brothers Co. 99

Maas & Waldstein Co. 89
Magnuson Products Corp. 106
Mahon Co., The R. C. 33
Meyercord Co., The 76-77
Miracle Paint Rejuvenator Co. 111
Murphy Varnish Co. 17

New Wrinkle, Inc. 39
New York Woodfinishers Supply Co. 105
No. Amer. Elec. Lamp Co. 108

Oakite Products, Inc. 47
O'Brien Varnish Co. 65

Paasche Airbrush Co. 63
Perfection Paint & Color Co. 8
Pittsburgh Plate Glass Co. 10-11

Qualatone Products, Inc. 69

Randolph Finishing Products Co. 83
Rayon Processing Co. of R. I. 107
Reliance Varnish Co. 37
Rockford Varnish Co. 81
Roxalin Flexible Finishes, Inc. ..... Second Cover
Rudd Lacquer Corp. 104

Sherwin-Williams Co. 34-35
Schrell & Brock 5-109
Standard Varnish Co. 93
Stanley Chemical Co. 101
Sterling Tool Products Co. 112
Stille-Young Corp., The 9
Sun Oil Company 53

United Lacquer Mfg. Corp. 7

Varnish Products Co. 8

Watson-Standard Co. 85
Walker Co., H. V. 58
Wilson-Imperial Co. 51

Zapon Division—Atlas Powder Co. 21

MIRACLE

5 Gallon BLUE BOY Model

PAINT REJUVENATOR

Restores Paints, Lacquers, Enamel Products and Pigment Primers, to original consistency in 3 to 10 minutes without opening the can. Available for Round or Square 5-gallon cans. Explosion-proof electrical equipment if desired. Also other units from ¼-pint to 50-gallon drum capacity available. Originators of Paint Rejuvenating equipment — ten years—thousands of satisfied users.

Miracle Paint Rejuvenator Co.

127 E. 9TH STREET ST. PAUL, MINN.

1st to finish!

Faster... more precise on wood, metal or plastics than hand or ordinary machine sanding!

STERLING
1000 ELECTRIC PORTABLE
SANDER

TIME IT YOURSELF! Compare Sterling sanding with the method you are now using. Ask for free demonstration!

ORBITAL MOTION of the sanding pad on the Sterling 1000 moves thousands of abrasive grits in 3/16" circular orbits against the work at a speed of 4500 oscillations per minute! Assures faster... more uniform sanding.

The Sterling 1000 covers the entire range of abrading from coarse sanding to lapping and finishing ... curved or flat surfaces. Vibrationless . . . easy to use . . . precise in operation. Important additional features described in new Sterling booklet. Write for your copy today!

For air-driven sanding ask about the Sterling Speed-Blac Sander!

STERLING TOOL PRODUCTS CO.

365 EAST OHIO STREET • CHICAGO 11, ILLINOIS

Los Angeles and Toronto

Saluting our Allies of UNITED NATIONS

★ One of a series to be published in the interest of the War effort. Back up our Allies! Back up our own heroes! Buy more bonds!

NORWAY

IN APRIL, 1940, the Nazis invaded Norway. After 4 years of occupation Nazification of Norway has failed because of almost universal opposition by the Norwegian people. However, this opposition has been costly, for it is estimated that the Norwegian State Bank has paid Germany 8,000,000,000 kroner, almost $12,000,000,000 in occupation costs since April, 1940. Norwegian economic experts estimated (April, 1943) that the Nazis have also looted Norway of nine billion crowns (approximately $2,137,500,000) during occupation. The cost of war and the price of freedom may be high but the price of serfdom is higher—much higher.

★★★★★★★

We here at Advance are 100% behind the call for unconditional surrender of our enemies—and we're doing all in our power to help bring it about. We're fighting, we're making war finishes—and buying bonds.

★

ADVANCE PAINT COMPANY

Manufacturers of Wood & Metal Finishing Materials

INDIANAPOLIS, INDIANA

Left Photo: One of the largest "A" Type Conveyor Ovens ever built. Installed in large southern Steel Mill.

Lower Photo: Drying oven installed at Estate Stove Co., reduced cost and improved quality of product.

KIRK AND BLUM INDUSTRIAL OVENS

SPEED WARTIME PRODUCTION

In plants throughout the nation, Kirk & Blum drying and baking ovens are turning out faster and better product finishing, stepping up rate of production, reducing fuel and labor costs—and very important, conserving manpower by promoting maximum safety.

Whatever your finishing problem may be . . . no matter how large or small your product . . . experienced Kirk & Blum Engineers are prepared to design a complete, properly coordinated drying or baking system that will do a BETTER finishing job—at LOWER COST.

SEND FOR ANY ONE OF THESE BOOKLETS:

- "Industrial Ovens"
- "Dust Collecting Systems in Metal Industries"
- "Blower Systems for Woodworking Plants"
- "Fan Systems for Various Industries"
- "Cooling Systems for the Glass Industry"
- "Data on Kirk & Blum Production Facilities"

THE KIRK & BLUM MANUFACTURING CO.

AN ORGANIZATION OF ENGINEERS AND MECHANICS

2831 SPRING GROVE AVE. CINCINNATI, OHIO